September

25 Cents
IN CANADA-THIRTY CENTS

AMAZING STORIES

Earl L. Bell

Cyril G. Wates

Capt.
S. P. Meek
U. S. A.

5 Easy Ways to Make $3.00 an hour in Your Spare Time in RADIO

Each of these plans, developed by the Radio Training Association of America, is a big money-maker. Set owners everywhere want to get rid of static, to have their sets operate from the electric light socket, the tone improved, and the volume increased, and transformed into single-dial controls. Phonograph owners want their machines electrified and radiofied. If you learn to render these services, you can easily make $3.00 an hour for your spare time, to say nothing of the money you can make installing, servicing, repairing, building radio sets, and selling supplies.

Over $600,000,000 is being spent yearly for sets, supplies, service. You can get your share of this business and, at the same time, fit yourself for the big-pay opportunities in Radio by joining the Association.

Join the Radio Training Association of America

A membership in the Association offers you the easiest way into Radio. It will enable you to earn $3.00 an hour upwards in your spare time—train you to install, repair and build all kinds of sets—start you in business without capital or finance an invention—train you for the $3,000 to $10,000 big-pay radio positions—help secure a better position at bigger pay for you.

A membership need not cost you a cent!

The Association will give you a comprehensive, practical, and theoretical training and the benefit of its Employment Service. You earn while you learn. Our cooperative plan will make it possible for you to establish a radio store. You have the privilege of buying radio supplies at wholesale from the very first.

Earned $500.00 Spare Time

Frank J. Deutsch, Penn.: "I have made over $500 out of Radio in my spare time."

Radio Engineer In One Year

Claude De Grave, Canada: "I knew nothing about Radio when I joined a year ago. I am now a member of a very exclusive organization of Radio Engineers, and my income is 225% greater than it was."

Doubles Income In 6 Months

W. E. Thon, Chicago: "Six months after I enrolled I secured the managership of large Radio Store and doubled my income."

Radio Training Association of America
Dept. RN-9, 4513 Ravenswood Ave., Chicago, Ill.

Gentlemen: Please send me by return mail full details of your Special Membership Plan, and also copy of your Radio Handbook.

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ACT NOW—If You Wish the No-Cost Membership Plan

To a limited number of ambitious men, we will give Special Memberships that may not—need not—cost you a cent. To secure one, write today. We will send you details and also our Radio Handbook filled with dollars-and-cents radio ideas. It will open your eyes to the money-making possibilities of Radio.

Radio Training Association of America
4513 Ravenswood Ave., Dept. RN-9, Chicago, Ill.

JULES VERNE'S TOMBSTONE AT AMIENS
PORTRAYING HIS IMMORTALITY

AMAZING STORIES

September, 1929
Vol. 4, No. 6

In Our Next Issue:

DEATH FROM THE SKIES, by A. Hyatt Verrill, is a unique story of exceeding interest. Being an ethnologist and archeologist of high reputation, Mr. Verrill must necessarily be conversant with many other branches of science. He has proved his versatility a number of times, but he has outdone himself in working out this interplanetary theme.

THE SECRET KINGDOM, by Otis Adelbert Kline. (A Serial in three parts). Part I. Do vanquished races really become submerged by the victorious nations or otherwise disappear? It may be a comparatively simple matter keeping tabs on exiled royalty or leaders nowadays; but what happened to the exiled rulers of the days before printing and wireless? Mr. Kline, who needs no introduction to our readers, gives some theories on the subject in convincing language and in a most plausible manner.

CHAMBER OF LIFE, by G. Peyton Wertenbaker. The author of "The Man From the Atom" comes back to us with an entirely new and original theme. It is a well-written story, picturing a perfectly ordered world.

THE STEAM GOD, by Walter Kateley. Geologic upheavals have created amazing changes and developed strange conditions, much of which has been studied by geologists. But there are still miles and miles of unknown lands. What peoples might be living in uncharted ice-lands or inaccessible valleys? Mr. Kateley has built up a story of logical sequence containing much of scientific value.

THE TWENTY-FIRST CENTURY LIMITED, by Paul Slachta. This is a great deal more than a story of aviation. Crowded out of the August issue.

And other stories.

In Our September Issue:

Our Cover

this month depicts a scene from the story entitled "The Red Peril," by Capt. S. P. Meek, U.S.A., in which is shown the futile attempts of the perfectly equipped American naval airships of the future to destroy the enemy craft, completely protected by a repellent element.

AMAZING STORIES MONTHLY. Published at 184-10 Jamaica Avenue, Jamaica, N. Y. Entered as second-class matter at Jamaica, N. Y., under the act of March 3, 1879. Title Registered U. S. Patent Office. European Agents, S. J. Wise Et Cie, 40 Place Verte, Antwerp, Belgium. Printed in U. S. A. Subscription price is $2.50 a year in U. S. and Possessions; $3.00 a year in Canada and Foreign Countries; single copies, 25 cents each. Editorial and Executive Offices, 381 Fourth Avenue, New York, N. Y. Publishers are not responsible for mss. lost, although every care is taken for their safety.

Have you the Courage to take it?

—This $2,000,000 Guarantee of a Job and Raise

OF course you'd like to earn $50 or $75 or $100 a week—you'd like to do more interesting work—you'd like to get into a line that offers a real future—but do you know how to go about *getting* these things?

If you have been thinking of "taking a course" but have held back because you were afraid you didn't have education enough to learn better-paid work—if you have hesitated to take the risk that it would actually land you in the better position and increase your salary—*then here's the best news you ever heard in your life!*

I want to tell you about DRAFTING, and show you that it offers you everything in pay and opportunity that you could hope for. I want to show you that a fine Drafting job is now easily within your reach. And I want to set before you an amazing plan which we have worked out with the co-operation of some of the biggest employers and engineers in America, to prepare you at home, in spare-time, get you the job and raise your pay—absolutely without risk of a penny on your part.

"Only one other man and I, of six taking California State Board examination for Architect, passed. Then I realized the thorough and practical training given by American School. In 18 months I have gone from tracer to Chief Draftsman, in charge of all architectural and engineering work in one of the oldest offices here."
R. L. WARREN,
Los Angeles, Calif.

Come Into DRAFTING!

Thousands of men—not a bit smarter than you, with no more schooling or experience—have gone from poorly paid positions as clerks, mechanics, building trade workers and laborers into Drafting positions paying $50 to $100 a week, with our help. Now with a job and a raise waiting for you *as soon as you are ready for it*, all it takes is the COURAGE to go after it—now if you remain in the rut it's because you choose to, not because you have to.

"When I started American School training in the Spring of 1915 I was working 12 hours a night, seven nights a week for $1.83 a night. That Fall I got a job in the Engineering Dept. of a large firm near here. Today I work 5½ days a week and my salary is larger than I ever dreamed of when I began that course in Mechanical Drafting."
B. H. SEAVERNS,
South Bend, Ind.

3 Drafting Lessons *Actually* FREE *to show you how interesting and simple Drafting is*

Maybe you think Drafting is "over your head"—that it takes artistic talent or some ability you haven't got. In that case you have a pleasant surprise coming to you. For I'll be glad to send you the first three lessons from our home-training to show you that the drawing of plans is purely mechanical, easily learned and the most interesting kind of work you ever tackled. It takes little enough courage *to look into* this wonderful opportunity—just mail the coupon and see for yourself how you like Drafting and our guaranteed way to get into it.

The American School Dept. D-653 Drexel Ave. and 58th St., Chicago, Ill.

Get this "No-Risk" Plan!

I wish I had the room here to tell you all about DRAFTING—how it has become the most important branch of every kind of manufacturing and building construction work—how fascinating the work is—the fine bunch of fellows you'll work with—the big salaries paid—the wonderful chances for advancement. How, while Drafting is white-collar office work, it is hooked up closely with big projects and big men, and offers the thrill that goes with making plans which govern every move of the men who do the work. All this inside dope takes a 36-page book to describe and I'll be glad to send you a copy free when you mail the coupon for my no-risk job and raise plan.

O. C. Miller
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THE AMERICAN SCHOOL
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Please send without cost or obligation, 3 Drafting Lessons, 36-page book with the inside dope about Drafting and your no-risk plan and guarantee to prepare me, to place me and raise my pay, or no cost.

Name.....

St. No.....

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

Age.....*Occupation*.....

I Will Train You at Home to Fill a Big-Pay Radio Job

IF you are earning a penny less than $50 a week, send for my book of information on the opportunities in Radio. It's FREE. Clip the coupon NOW. A flood of gold is pouring into this new business, creating hundreds of big pay jobs. Why go along at $25, $30 or $45 a week when the good jobs in Radio pay $50, $75, and up to $250 a week. My book, "Rich Rewards in Radio," gives full information on these big jobs and explains how you can quickly become a Radio Expert through my easy, practical, home-study training.

Salaries of $50 to $250 a Week Not Unusual

Get into this live-wire profession of quick success. Radio needs trained men. The amazing growth of the Radio business has astounded the world. In a few short years three hundred thousand jobs have been created. And the biggest growth of Radio is still to come. That's why salaries of $50 to $250 a week are not unusual. Radio simply hasn't got nearly the number of thoroughly trained men it needs. Study Radio and after only a short time land yourself a REAL job with a REAL future.

You Can Learn Quickly and Easily in Spare Time

Hundreds of N. R. I. trained men are today making big money—holding down big jobs—in the Radio field. Men just like you—their only advantage is training. You, too, can become a Radio Expert just as they did by our new practical methods. Our tested, clear training, makes it easy for you to learn. You can stay home, hold your job, and learn quickly in your spare time. Lack of education or experience are no drawbacks. You can read and write. That's enough.

Many Earn $15, $20, $30 Weekly on the Side While Learning

My Radio course is the famous course "that pays for itself." I teach you to begin making money almost the day you enroll. My new practical method makes this possible. I give you SIX BIG OUTFITS of Radio parts with my course. You are taught to build practically every type of receiving set known. M. E. Sullivan, 412 73rd Street, Brooklyn, N. Y., writes, "I made $720 while studying." Earle Cummings, 18 Webster Street, Haverhill, Mass.: "I made $375 in one month." G. W. Pake, 1807 21st Ave., Nashville, Tenn.: "I picked up $935 in my spare time while studying."

Your Money Back If Not Satisfied

"I'll give you just the training you need to get into the Radio business. My course fits you for all lines—manufacturing, selling, servicing sets, in business for yourself, operating on board ship or in a broadcasting station—and many others. I back up my training with a signed agreement to refund every penny of your money if, after completion, you are not satisfied with the course I give you.

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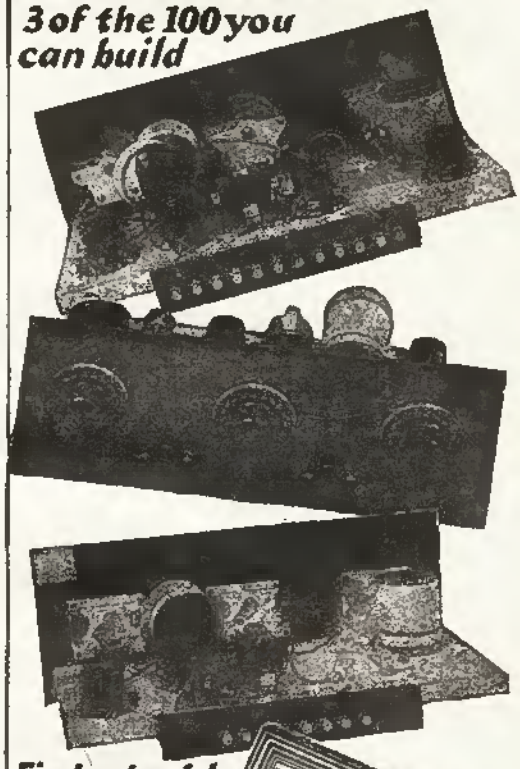
Send for this book of Radio information. It won't cost you a penny. It has put hundreds of fellows on the road to bigger pay and success. Get it. Investigate. See what Radio has to offer you, and how my Employment Department helps you get into Radio after you graduate. Clip or tear out the coupon and mail it RIGHT NOW.

J. E. SMITH, President
Dept. 9WT
National Radio Institute
Washington, D. C.

You can build 100 circuits with the six big outfits of Radio parts I give you

3 of the 100 you can build



Find out quick about this practical way to big pay

Mail This FREE COUPON Today

J. E. SMITH, President
Dept. 9WT, National Radio Institute
Washington, D. C.

Dear Mr. Smith: Kindly send me your big book, "Rich Rewards in Radio," giving information on the big-money opportunities in Radio and your practical method of teaching with six big Outfits. I understand this book is free, and that this places me under no obligation whatever.

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

Address .....

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

Occupation .....

Here's the PROOF

$375 One Month In Spare Time

"Recently I made $375 in one month in my spare time installing, servicing, selling Radio Sets."
Earle Cummings,
18 Webster St.,
Haverhill, Mass.

Jumped from $35 to $100 a Week

"Last week I had the pleasure of earning $110 servicing and selling Radio sets. I have made as high as $241 in two weeks. Before entering Radio I was making $35 a week. It is certainly great sport to do this kind of work."
J. A. Vaughn,
4202 Arsenal St.,
St. Louis, Mo.

$450 a Month

"I work in what I believe to be the largest and best equipped Radio shop in the Southwest and also operate KGFI. I am averaging $450 a month."
Frank M. Jones,
922 Guadalupe St.,
San Angelo, Tex.

RADIO NEEDS TRAINED MEN!

Employment Service to all Graduates

Originators of Radio Home Study Training

VOLUME 4

AMAZING STORIES

THE MAGAZINE OF SCIENTIFICTION

SEPTEMBER, 1929 No. 6

ARTHUR H. LYNCH, *Editorial Director*

T. O'CONOR SLOANE, Ph.D., *Associate Editor* MIRIAM BOURNE, *Associate Editor*

C. A. BRANDT, *Literary Editor*

Editorial and General Offices: 381 Fourth Avenue, New York, N. Y.

Extravagant Fiction Today - - - - - - - - - Cold Fact To-morrow

The Editor and the Reader

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

SOME twenty centuries ago the question was asked why no one is content with his lot in life. The soldier wants to be a merchant and everyone in any vocation wishes he had some other one. It is very easy to complain about the troubles that come into the editorial sanctum. But there is so much in the kind appreciation of our readers, who sometimes seem to us to be too flattering in their comments, that this compensates for many troubles. In AMAZING STORIES it is absolutely necessary that every story which goes to the printer should be examined for correctness, and in many cases must be edited and changed a little from the standpoint of grammar perhaps and of the rules of correct composition. But the editor here is walking on very slippery ground. Many authors are unduly sensitive. In pre-Victorian days authors were very willing to submit their writings to critics for emendation. But the author of today often objects to even minor changes, overlooking the fact that frequently two heads are better than one. But there is no difficulty in correcting errors of composition, tautology and the like—all this is simplicity itself if the author will stand for it.

And then we come to natural science. The science which appears in our stories has a range and extent to cover nearly everything in nature. The letters which we publish in our "Discussions" column are only a few of those which we receive, so we know that any blunders will be noted by some of our readers. Thus the question of size of a cube which could exactly fit into a sphere of given radius came up in a story published in a recent issue. This is an interesting calculation and some of our mathematically disposed readers might be interested in deducing the formula. We will not do it for them, but will hope to receive some letters giving the results of their work. The formula can be deduced on the basis of the square of the hypotheneuse, the famous proposition of Euclid, often mistaken for the *Pons Asinorum*, the "Bridge of Asses," which is a different one.

Even in this case in our editorial work we ran across an error. It was the one cited above. The writer of the erroneous passage called the hypotheneuse proposition the *Pons Asinorum*, and the curious feature about it was that the perpetrator of the error was a most distinguished scientist. But it is fair to say that no one except an editor realizes the multiplicity of errors that are made by writers. In the case cited above of a cube inside of a sphere there was an error which we corrected, and this error was made by an exceptionally competent and highly educated electrician.

One of the curious errors we have run up against is the statement which was made by an author in one of his stories, that one pole of a magnet attracts iron filings, and that the other pole disperses them. This, of course, is absolutely wrong and had to be edited out.

In former days some authors had a way of fighting with their best friend, the proofreader. The old-time proofreader was devoted to his work and watched for every kind of error, literary, historical or scientific. Where arithmetical calculations appeared, he would go over them to see if they were correct. A quotation attributed to the wrong author would elicit a suggested change in the name. It seemed to be a matter of pride with him, and yet he had to contend with all kinds of personalities among the authors, some of whom angrily resented any changes. Really the proofreader was the author's best friend and his assistant. But those good old days are gone and the editors of AMAZING STORIES themselves have to watch for every conceivable mistake.

Any printer who has had extensive experience with authors can tell strange stories about the way they act with regard to corrections of their copy. They are a very sensitive class of people. We know of a case in which in a long story about four words were changed, and the author objected quite strongly to this. In the proverbial expression, in dealing with authors you are skating on very thin ice. At least, the editor and printer always feel insecure, even when they know that they are improving a faulty passage. It sometimes seems as if an author should be grateful for adequate criticism of his manuscript. It is not always a pleasant thing for the editor to correct it, which makes it doubly hard for him to get scolded for doing so.

Then comes the question of authors. There is no need to recapitulate their names. There are a number of them that have done much for us in past years—they are all at our service and are so highly appreciated by our readers that there is danger of a lack of variety. But it will not do for a magazine to have too small a staff of authors. It is essential that its pages should be open to newly discovered merit, not only to the personality of the writer. It is said to be impossible to please everybody, but the letters which we publish are, as a rule, extremely commendatory and we can assure our readers that we do not select those which praise us, but put in criticizing letters as they come along.

"Our magazine" some of our correspondents consider it—this is what we wish it to be. Interplanetary stories are great favorites and have had many votes of preference and these we must give. But they are based on imagination and the science in them must be inevitably stretched a lot to cover the distances to be traversed. We have received many other votes of preference from our readers, and strive to follow them, but it is not always possible. But our desire now as always is to call this "your magazine"; to have you call it "our magazine," claiming it as your own, and to feel that our readers are a body of editors to help us by suggestions and encourage us by good wishes, and when we deserve it, to criticise us and tell us of our shortcomings.

The Red Peril

By
Capt. S. P. Meek, *U. S. A.*

Author of "Murgatroyd Experiment," and "Futility"

ANNIHILATION by deadly germs, which is the shape that future international warfare may take, is told of in this story. Captain Meek is an army man, closely allied with matters of war therefore and much interested in its possibilities. Besides being an army man, however, he has a vivid imagination that builds constructive pictures—even of entirely new methods of warfare—and a knack for transmitting these pictures by way of the word. An engineer of high standing said of this story, "It is certainly logical and may well be conceived before the next war."

"WHAT do you know about tularemia?"

The Assistant Chief of Staff, G-2 (Military Intelligence) looked up at the Surgeon General with a puzzled frown.

"Never heard of it," he said. "Wait a minute, though, it seems to sound familiar. Wasn't there a rabbit disease of that name prevalent in the west a few years ago?"

"That's it," replied the Surgeon General. "It has appeared in the United States again and has also made its appearance in Europe and Asia."

"Rather hard on the bunnies," laughed General Munroe, "but then, 'men must hunt and bunnies must weep,' you know. I didn't know that you were a hunter."

"It is more serious than a matter of hunting," said the Surgeon. "This is a new and more virulent form of the disease and so far we have found no way of combating it. Not content with cleaning out the rabbits, it has spread to guinea-pigs and already they are scarce all over the world. If a war were to break out now, we would be practically defenceless."

"That *is* serious," replied General Munroe, a twinkle in his eye, "think of all our crack regiments of guinea-pigs lying dead and unable to interpose their brave bodies between our homes and a foreign invader. However, Humboldt, cheer up; all is not yet lost. I have it quite confidentially that the navy are ready to substitute squirrels for guinea-pigs as engineers and use cats instead of rabbits as able seamen, so the ships can still function. I'll have the Chief of the Air Corps in right away and tell him to make plans to use pigeons and canary birds as flyers, so we may be able to hold out for a few days even if war does come."

General Humboldt snorted in disgust.

"That is about what is to be expected from a wooden-headed Artilleryman," he remarked. "I suppose that you think your remarks are humorous. The humor may strike you as rather forced if you will think for a minute and realize that ninety-five per cent of the disease serums we manufacture are made from cultures of either guinea-pig or rabbit blood. As far as men and guns and ships and aircraft go, we are well prepared, but how could we combat a disease germ offense, if one were launched against us?"

General Munroe sat back suddenly.

"Nonsense, Humboldt," he said sharply, "such a thing is unthinkable. No nation would dare to use disease germs in the face of International Law."

"International Law didn't stop the use of poison gas in 1915. If the thought of a disease germ offensive is so impossible, why have we done so much research work on bombs for that purpose?"

General Munroe drummed absently on his desk.

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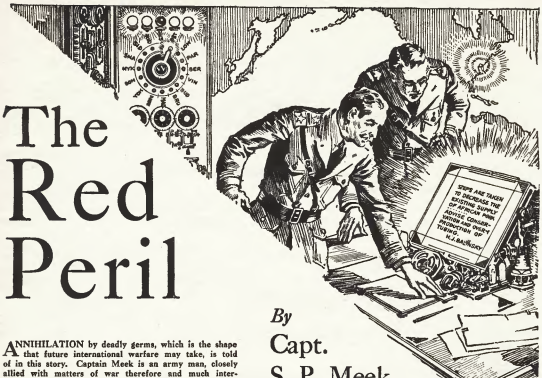

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"I beg your pardon, Humboldt," he said. "It didn't seem serious. That phase of it didn't strike me at first."

"It wouldn't," retorted the Surgeon General. "Nothing less than an eighteen inch gun can make an impression on you. If you are sufficiently impressed with the real seriousness of the situation, I'll tell you something about tularemia and also inform you of what information I need."

"I am at your service," answered General Munroe.

"Tularemia," said the Surgeon General, "originally made its appearance in the United States in southern Nevada some thirty years ago; in 1927 to be exact. At first it was confined to jackrabbits and did not spread. In 1929 it appeared in California and also east to Utah and began to attack all types of rabbits. It almost wrecked the rabbit industry of California and it threatened to spread all over the country.

"Serum therapy was in its infancy at that time. About all the serums that we had were for smallpox, typhoid, paratyphoid, tetanus, rabies, diphtheria and spinal meningitis and some of them were not altogether certain in their action. As a result, the War Department was not especially interested, but the Department of the Interior was. The rabbit breeders and the sportsmen of the country united in demanding action and in 1931, after our veterinarians had confessed to failure, they imported Professor Stieffel from Belgium and paid him half a million to solve the problem. He worked at it for about a year and perfected an antivirus that did the work. He started in Wisconsin and almost wiped the disease out in a year. It took about two more years to completely eliminate it, but it finally disappeared and there hasn't been a case reported from 1934 until about three months ago.

"The first case was reported near El Paso, Texas, and it was regarded as a mere freak and unimportant. Rabbits were treated with Stieffel's virus and it was confidently expected that the disease would die out in a few weeks. Instead it spread with alarming rapidity. Within a month of the first case, others were reported almost simultaneously from such widely separated places as Bangor, Maine; Orlando, Florida; Tacoma, Washington, and Tampico, Tamaulipas. It has been reported from every one of the ninety-one states except Ontario, Nicaragua, Yukon, Maryland and Mississippi.

"AT first the disease followed the same course as the attack of 1927-1934, but now it has extended its range and is attacking practically every rodent in the country. Not only rabbits and guinea-pigs, but also rats, mice, gophers and squirrels have been reported among its victims. It is a different type and Stieffel's virus has no effect on the affected animals and is even useless as an immunizer. However, there is one bright side. Tularemia, as we formerly knew it, used to attack, with great virulence, people who handled the affected rodents. But this new form does not seem to affect humans."

"That's a good thing," interjected Munroe.

"Very good, but from the standpoint of national defense, it might be better if it attacked people and left guinea-pigs alone. As you probably know, the Medical Department has prepared and has in storage about a billion tubes of anti-disease serums of all kinds, enough to immunize less than one-fourth of the population of the United States against all diseases. The reason for this shortage is partly lack of money which has been spent on aircraft and big guns, instead of where it should have been used, and partly the fact that over thirty serums, notably those for cancer, pneumonia and leprosy, cannot be stored, but must be used almost as soon as manufactured."

"All are already immunized against cancer, are they not?"

Illustrated by WESSO

¶ In a few moments, a picture of a wireless dispatch showed on a ground-glass screen over the desk.

How important a figure has the scientist become in the field of military achievement?

Illustrated by WESSO

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"I am at your service," answered General Munroe.

"Tularemia," said the Surgeon General, "originally made its appearance in the United States in southern Nevada some thirty years ago; in 1927 to be exact. At first it was confined to jackrabbits and did not spread. In 1929 it appeared in California and also east to Utah and began to attack all types of rabbits. It almost wrecked the rabbit industry of California and it threatened to spread all over the country.

"Serum therapy was in its infancy at that time. About all the serums that we had were for smallpox, typhoid, paratyphoid, tetanus, rabies, diphtheria and spinal meningitis and some of them were not altogether certain in their action. As a result, the War Department was not especially interested, but the Department of the Interior was. The rabbit breeders and the sportsmen of the country united in demanding action and in 1931, after our veterinarians had confessed to failure, they imported Professor Stieffel from Belgium and paid him half a million to solve the problem. He worked at it for about a year and perfected an antivirus that did the work. He started in Wisconsin and almost wiped the disease out in a year. It took about two more years to completely eliminate it, but it finally disappeared and there hasn't been a case reported from 1934 until about three months ago.

"The first case was reported near El Paso, Texas, and it was regarded as a mere freak and unimportant. Rabbits were treated with Stieffel's virus and it was confidently expected that the disease would die out in a few weeks. Instead it spread with alarming rapidity. Within a month of the first case, others were reported almost simultaneously from such widely separated places as Bangor, Maine; Orlando, Florida; Tacoma, Washington, and Tampico, Tamaulipas. It has been reported from every one of the ninety-one states except Ontario, Nicaragua, Yukon, Maryland and Mississippi.

"AT first the disease followed the same course as the attack of 1927-1934, but now it has extended its range and is attacking practically every rodent in the country. Not only rabbits and guinea-pigs, but also rats, mice, gophers and squirrels have been reported among its victims. It is a different type and Stieffel's virus has no effect on the affected animals and is even useless as an immunizer. However, there is one bright side. Tularemia, as we formerly knew it, used to attack, with great virulence, people who handled the affected rodents. But this new form does not seem to affect humans."

"That's a good thing," interjected Munroe.

"Very good, but from the standpoint of national defense, it might be better if it attacked people and left guinea-pigs alone. As you probably know, the Medical Department has prepared and has in storage about a billion tubes of anti-disease serums of all kinds, enough to immunize less than one-fourth of the population of the United States against all diseases. The reason for this shortage is partly lack of money which has been spent on aircraft and big guns, instead of where it should have been used, and partly the fact that over thirty serums, notably those for cancer, pneumonia and leprosy, cannot be stored, but must be used almost as soon as manufactured."

"All are already immunized against cancer, are they not?"

"Unfortunately not. While a great many states have made immunization for cancer and smallpox compulsory, some of them have not, and many have exempted those claiming a conscientious objection to the use of serums. From available statistics I estimate that we would require, in the event of a declaration of war, fully five times our present reserve supply of serums to protect everyone. Normally such a supply could be produced in five months if all laboratories worked at capacity on it, but with our present shortage of guinea-pigs it would take about two years. If the rodents diminish as rapidly during the next three months as they have the last three, it would take eleven years, and in a year from now, unless we can check the tularemia, it will be impossible to protect the entire population in any length of time."

"The situation certainly looks serious," admitted General Munroe. "What can I do to help you?"

"I want you to give me everything in the Military Intelligence file and get me everything in the State Department and the Interior Department files on the following subjects: Tularemia, shipments of guinea-pigs and other rodents, disease germ bearing bombs and projectiles and Balinsky."

"Balinsky?" asked General Munroe as he paused from his task of writing down the subjects which the Surgeon General was rattling off.

"Yes," replied General Humboldt. "I have an idea that Balinsky may be at the bottom of it. From the nature of the outbreak, I feel certain that it is the first move of a hostile government bent on war. The only storm center that I can see is Russia and naturally my thoughts turn there first. Another reason is that Feodor Balinsky is probably the most profound serumologist and physiological chemist in the world. Until he left the United States and went to Russia on Gorodin's invitation four years ago, he did more in the lines of improving serums and combating disease than any one else. He has dropped completely out of sight for two years, and he is the only man that I know of with the ability to produce such results, whose life is not an open book."

"Those files will be in your office this afternoon," said Munroe as he placed a penciled memo which he had prepared, in a holder, focused a light on it and pressed a button.

"That is an ingenious apparatus," said General Humboldt admiringly as he glanced at the holder.

"Quite good," conceded Munroe. "Major Hamilton of the Signal Corps perfected it a few months ago. It is in effect, a direction-controlled, portable television apparatus, but the ingenious part of it is that it can be neither tapped nor interfered with like an ordinary wireless television. This memo will be simultaneously reproduced in the Adjutant General's Office, the State Department and the Interior Department in St. Louis."

"Very ingenious," replied the Surgeon General as he bowed himself out.

When General Humboldt had left, General Munroe sat in silence for a few minutes drumming on his desk. Presently he pressed a button before him.

"Wavelength, please?" said a feminine voice.

"QXBR over 3," he answered.

"Thank you," replied the voice and a buzzing sound filled the office.

"General Diesen," announced a crisp voice.

"This is Munroe, General," he said, "are you busy?"

"Not too busy to talk for a minute."

"Good enough. I have something of enough importance to warrant a personal conference. Will you have Butler up to your office in ten minutes and if the Secretary of State and Secretary Warren aren't busy, I think that they would be interested."

"I'll get them," replied the voice.

Ten minutes later, General Munroe knocked on the door of the private office of the Chief of Staff. In response to an invitation he entered, saluted General Diesen, shook hands with the Secretaries of State and War and nodded affably to General Butler, the Assistant Chief of Staff, G-5 (War Plans).

"What's on your mind, Munroe?" asked the chief of Staff.

"It's pretty important, I think," he replied as he took a seat. "General Humboldt was in to see me and he tells me that the supply of guinea-pigs is running short."

The Secretary of State laughed agreeably, but a frown came on General Diesen's face.

"What is this, Munroe, a joke?" he said sharply.

"That's what I thought it was when Humboldt first sprang it on me," replied Munroe, "but he showed me that it wasn't. Let me tell you what he said."

In a few words he outlined the news which the Surgeon General had given him a few minutes before.

"Of course, it's primarily an M.I.D.* matter," he went on, "but you know how touchy old Humboldt is, so I ordered our files out for his inspection and I requested State and Interior to cooperate. Meanwhile I asked for this conference.

"There may be something in what Humboldt says," remarked the Chief of Staff thoughtfully. "Mister Secretary, is there any unusual evidence of tension in the direction of Russia?"

"We have no diplomatic representatives in Russia," replied the Secretary of State, "but of course we get everything they send out on the general broadcasts. Their tone has been unusually arrogant and truculent for the last two months but I have laid it to the fact that they have a new premier, Zaneff, and that he is trying to impress the Commissars with his importance and energy."

"Have we no secret agents in Russia?" asked the Chief of Staff.

"Yes, we have a number, but since Zaneff has got in power, there has been a new and more rigid censorship on the outgoing messages and we have received very few reports and at least one of them was obviously doctored in transmission. All that we could make out of it was something about a decrease in the supply of African pork, or some such gibberish."

General Munroe sprang to his feet.

"Get that message, Mister Secretary," he cried, "I think I see a light."

The Secretary of State stepped to General Diesen's communicator and spoke a few words of direction and in a few moments a picture of a wireless dispatch showed on a ground glass screen over the desk. General Munroe studied it thoughtfully.

" 'Steps are being taken to decrease the existing supply of African pork. Advise conservation and overproduction of tubing. H. J. Balinsky,' " he read. "Is your agent's name Balinsky?"

"His symbol is H.J.," explained the Secretary. "Those initials are prefixed to any convenient name."

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*Military Intelligence Division.

"The name, Balinsky, is in itself significant," replied Munroe, "and taken with the rest of the message, it is highly illuminating. Humboldt was right."

"What do you make of it, Munroe?" cried General Diesen.

"Pork, of course, comes from pigs and Guinea is an old name for Africa. Serums are stored in hermetically sealed tubes. I would think that your agent was afraid that this message would be intercepted and decoded and so he disguised his wording, hoping that the very oddity would attract attention and that some one in the State Department would dig out his meaning. I would read the message this way: 'Steps are being taken to decrease the world's supply of guinea-pigs. It will probably succeed, so I advise the hurried production and storage of a large supply of serums. Balinsky is at the bottom of it.'"

"By God, I believe you're right!" exclaimed the Secretary of War. "General Butler, get out the plans on Russia at once and bring them here. General Diesen, have all the Chiefs of Branch report here in five minutes. If this is what we think it is, minutes count."

LIEUTENANT EDDY of the United States Air Corps swung idly around on a fifty mile circle over New York City. The Lieutenant was doing a turn on patrol duty at the sixty thousand foot level and time was passing slowly for him.

"It's a lovely war," he mused as he glanced out through the rock crystal windows of his cabin, kept clear of frost by the exhaust of his atomic engine, "for three weeks the General Staff has been confabbing away in Washington and they've kept the wartime patrols over every big city and there has been no declaration of war nor any signs of one and not a blamed thing has happened. Why can't they leave us on the ground for a while?"

He came to the limit of his patrol area and lazily swung his rudder and turned around to go back over his route. He glanced at his airspeed meter and at the tachometers attached to the huge propeller and the elevating fans which were driven by the tiny atomic engine concealed in the hull. Everything was functioning perfectly and he set his rudder for straight ahead and stepped to the high powered telescope that formed part of his equipment and swept the horizon carefully. Nothing was visible at his level except the connecting patrol some fifty miles away, but far below him the air liners and the freight transports were swinging along on orderly lines. On a still lower level, so far below him as to be out of sight except through the telescope, little pleasure flyers bustled to and fro over the huge city. The Lieutenant scanned the horizon again and yawned. At his normal cruising speed, and he was in no hurry, it would take him about five minutes to cover the fifty miles that intervened between his position at the turn and the limits of his post and he threw himself down on the cot that occupied one side of the cabin of the scouting aerostat. He gazed sleepily up into the cloudless sky above him, his mind a blank. Far above him a tiny speck attracted his attention and he watched it idly. Suddenly a thought struck him that brought him bolt upright.

"What the dickens?" he ejaculated. "I am at sixty thousand unless my altimeter is a liar. What can that speck be? There isn't a craft made that has a ceiling of over eighty thousand and that speck is a lot higher than that."

He turned his telescope upward and examined the suspicious object. The powerful instrument showed it to be a rectangular block of some dark substance and Lieutenant Eddy was sure that he could see the blur of propellers at one end of it. He adjusted his sound locater and the hum of powerful atomic engines filled his cabin. Hurriedly he swung his range finder on the strange craft. He shook his head in unbelief as he read the figures recorded. He rubbed his eyes and adjusted the range finder again.

"Forty-five thousand!" he exclaimed. "I am sixty thousand up. Why, that craft must be twenty miles above ground! Impossible!"

Again he read the range and then read the angle subtended by the strange machine.

"About three hundred feet long and ninety feet wide," he said after a moment of calculation, "and it's twenty miles up. I'd better report it."

He turned to his communicator and pressed his key, but only a snapping, spitting sound rewarded him. Powerful interference waves from the monster of the sky above him had rendered his communicator temporarily useless. As he glanced up again, he saw that the black craft was nearer and was coming toward him rapidly. Following it were three more machines of the same type.

Thoroughly alarmed, Lieutenant Eddy shut off his elevation fans and his propeller and allowed his ship to drop like a plummet toward the earth. Another glance aloft showed him that the strangers were overtaking him and he turned the telescope on them. They resembled a brick in shape and so far as he could see were of solid black material with no signs of windows. At one end were three large propellers capable of driving the unwieldy mass at a terrific speed. There were no signs of elevation fans or even of the crude planes used on the earlier types of aircraft. Puzzled as he was, he had time to note on one end, blazoned in sombre colors, the emblem of the Russian Union of Soviet Republics.

The Russian ship was rapidly overtaking him and Lieutenant Eddy took a chance on a maneuver that was taught in the flying schools to be used only as a last resort. Throwing his horizontal rudder hard up, he turned the nose of his aerostat toward the ground and pulled the control lever of his propeller forward to the last notch. At over two thousand miles an hour the tiny scout rushed toward the ground. For ten seconds he kept on at this headlong pace and then leveled his ship and threw his elevating fans into gear. The whole ship groaned and rocked with the effort, but the downward speed was gradually checked and the ship came to a momentary rest and then started to climb when he was a bare five hundred feet from the ground.

"That was a close shave!" he muttered as he adjusted his elevating fans to hold his elevation and throwing into action the powerful atomic searchlight that warned all ships that he was on government business and had the right of way, he headed at top speed toward his patrol hangars on Long Island. The Russian ships were no longer in sight to his naked eyes, but his telescope revealed them as high in the air and climbing rapidly.

Ten minutes later he was describing his adventure to the Chief of Staff and the Chief Air Officer in Washington. His story was almost beyond belief but all aircraft in the vicinity of New York were ordered to take the air and observe the strangers. The first ships up

reported the Russian craft as visible through their telescopes at unbelievable heights and still climbing. They were soon out of sight even torough the powerful telescopes with which the American scouts were equipped.

The next day at noon the Russians attacked. The four mighty ships came into view above the city and swung majestically down until they were at an elevation of five thousand feet. It could be seen then they were shaped like rectangular blocks, about three hundred feet long by ninety feet wide and about fifteen feet high. The bottom of each ship consisted of a layer of some black substance, but the material of the other five sides was clear and crystalline, resembling glass or rock crystal, crisscrossed with wide ribbons of presumably the same black substance as composed the bottom. Inside could be seen powerful atomic engines which drove three huge propellers which projected through one of the glass ends of the machine. There was no sign of elevating fans.

SO far the Russians had committed no overt act and although the American fleet hung close around them and the anti-aircraft batteries on the harbor were manned, not a gun was fired. Suddenly a rocket rose from one of the Russian craft and at the signal each of the four dropped, from keel batteries, a single bomb. The ships moved forward slowly, dropping a bomb each in response to the signals of their leader, at quarter-mile intervals.

This was the hostile act for which the American craft had been waiting. From the aerostat which flew the pennon of the Harbor Defense Commander, three green lights flew into the air. Hardly had they been launched than from a thousand craft of all sizes which had been maneuvering around, above and below the hostile fleet, a perfect torrent of gunfire was opened. The air shook with the crash of the guns and the Russians were hidden from sight by the curtain of smoke from the bursting high explosive shells which surrounded them.

The firing ceased for the American craft could not see the enemy and were afraid of hitting one another. As the smoke cleared away, the four massive ships were seen moving slowly and steadily forward, apparently none the worse for the bombardment to which they had been subjected. Not a single opposing shot came from the Russian fleet.

The Harbor Defense Commander gave the signal to cease firing and with intrepid bravery ordered his ship forward to within three hundred yards of the invaders. The American craft was a huge hundred man cruising aerostat of the latest model and equipped with a six inch rifle carrying a shell with a bursting charge of forty-eight pounds of radite, the most powerful explosive known, for in addition to its demolition power, it had an atomic disintegrating effect that did a thousand times more damage than a similar weight of ordinary high explosive.

This gun, enormous in power, the largest ever taken into the air, was trained on the invader at pointblank range and the Commander himself fired it. The American ship rocked under the recoil and from the side of the Russian came a blinding flash and a cloud of smoke.

"A direct hit!" cried the Gunnery Officer.

The smoke cleared away and the Russian ship moved forward, uninjured by the blow it had received.

"That stuff can't be glass or rock crystal," exclaimed the Gunnery Officer. "Why, man alive, thirty inches of the best steel would have given way before that much radite."

"It's too much for me," replied the Commander. "There is only one thing to do. Order all ships out of the danger zone and let the eighteen inch rifles on Governor's Island take a try at it."

The anti-aircraft batteries had no better luck. The gunners were well trained and the target was large and close and moving slowly and time after time direct hits were reported by the observers, but even three tons of steel and radite did not seem to affect the Russian fleet. In despair, the Commander ordered another general attack by his air fleet.

Around, over and under the invaders, the Americans swooped and guns of every caliber from the tiny .256 machine guns carrying radite charged bullets to the six inch rifle of the Commander's craft poured their fire unavailingly at the strangers. One daring flyer in a one-man scout drew off a few miles to get up velocity and, abandoning his ship for a parachute, set his controls to send his scout headlong into one of the Russian craft at a speed of over two thousand miles an hour. The Russian was not injured, but the crumpled remains of the American craft tumbled to the ground.

Not a shot did the attackers fire. They merely maintained their even pace over the city and back again, dropping their bombs with monotonous regularity. When they had covered the ground to their satisfaction, in response to a signal from their leader, they started to climb. The American fleet followed them to the upper limit to which an aerostat could reach (about seventy-five thousand feet) and chagrined, watched the strangers rise to a height of about twenty miles and take their way east at a pace of about a thousand miles an hour.

The bombs which had fallen on New York had apparently done no damage. They were of the common fifty pound demolition type, but the bursting charge had been reduced to such a small amount that they did no damage when bursting on impact. They merely split open and threw their contents, which resembled fine dust, into the air where the wind caught it and whirled it around. The New Yorkers had taken to the lower stories and the basements at the start of the attack, but as bomb after bomb fell without doing damage, they came out into the streets in swarms and picked up fragments of the shells as souvenirs. Only a half dozen injuries were reported and they were all caused by the victims being struck by fragments of the shells which the American craft had fired at the invaders.

The attack was on Tuesday and it was not until the following Saturday that any explanation came. The newspapers reported the bombing of London and Paris on Wednesday, of Rome and Constantinople on Thursday and of Calcutta and Pekin on Friday. In each case the raid was a duplicate of the attack on New York. The Russian ships did not fire a shot but moved slowly over the city, impervious and contemptuous of attacks made on them, dropping their bombs at regular intervals. In each case when the attack was completed, they rose to a height of about twenty miles and moved off in regular formation.

Repeated messages to Leningrad and Moscow brought no reply. As far as the rest of the world was concerned, the Russian communication stations had ceased to exist. The executive heads of the nations of the world hurriedly assembled at Honolulu to discuss plans and the younger, hotter headed among them urged an immediate invasion of Russia by the aerial navies of the world and an extensive program of reprisals. The older men kept

their heads and pointed out that so far the Russians had done no damage, had taken no lives and had injured no property.

"We have, however, learned that we are absolutely powerless against them," said the aged Governor Martin of France. "So long as they content themselves with showering our cities with dust, let us not be thrown into panic. I was in Paris Wednesday when the attack came and I tell you that the urchins of the street might as well have tossed apples at them, for all the harm that our batteries and aircraft could do to them. They are supreme in the air and if we should attack them in their homes, they would come back and, instead of dust, they would drop radite, and how could we prevent them? No, let us wait. Soon they will tell us their object, and it may be that we can treat with them. Meanwhile, let each of us set our greatest scientists to work in the hope that they will discover the secrets of these new machines and find some way of combating them."

THE conference adjourned after deciding that the words of the Governor of France were the best counsel that could be had in the emergency that all felt threatened them. On Saturday Russia spoke.

"Workers of the World," read a general broadcast from Leningrad, "the time for the world revolution has arrived. For two generations your brethren in Russia have labored for you, working toward the glorious end to which we have attained. Your rulers who are grinding you into the dust have felt the power of the people and will not dare to oppose your will. Arise and throw down the false governments who enslave you and turn toward the glorious sun of freedom which shines alone in Russia. Our airfleet has passed over the great cities of the world and has shown its irresistible power. None could oppose it. No one was harmed for we did not wish to harm our brothers. But next time, we strike to kill.

"One week is allowed before we strike. If, during that week, any nation completely overthrows its present government and agrees to receive Commissars from Russia to exercise the supreme government until the workers learn from them the pure principles of freedom, that nation will be spared. Woe to the nation that clings to its chains and prefers the fleshpots of Egypt to the priceless boon of freedom which is offered, for that nation will perish from the face of the earth. Woe to the rulers who oppose the voice of the people, for their portion shall be death. Woe to the rich men who hold the lands and goods which belong of right to the people, for their portion shall be slavery. Woe to the preachers of false doctrines for their portion shall be everlasting silence. Workers of the world, you have one week in which to gain your freedom with our aid. One week from today, we strike!"

Hurried conferences of the governments of the world were called. There was no doubt of the power of Russia to inflict untold damage and suffering if their terms were not accepted and some of the weaker and more timid nations were inclined to accept the terms offered, pointing out that once they had obtained the secrets of the machines, they would build their own and bid defiance to Leningrad. The stronger nations pointed out that the demands made by the Soviets would cripple any country accepting the terms for at least a generation. The conference broke up with no decision reached.

The Congress of the United States was hurriedly assembled by the President and the matter laid before them. The question was debated futilely for a day, and then Morgan of Kansas, one of the leaders of the Senate, rose.

"Gentlemen," he said, "we are not the ones to decide this question. We can only reach one decision, for our execution *en masse* is demanded as one of the terms of surrender. Despite what any one may say, a vote here would result in an almost, if not quite, unanimous decision to fight. I move that the President be directed to disregard the constitution in this emergency and call for a nationwide ballot on Wednesday to decide the matter."

The motion was passed by acclamation and the President's call for a general ballot of the nation went out. The rest of the world held its breath and it was tacitly understood that the action of the richest and most powerful nation would be followed by the rest. The military heads of the nations worked night and day perfecting defense plans for use in case resistance was decided on, while government heads kept their private aircraft in readiness for a hurried flight, should the ballot ask for submission.

Wednesday broke bright and clear. The balloting was to start at 7:00 A. M. and at 6:30, the Soviet craft appeared over New York, Chicago, Detroit and Philadelphia. They made no hostile move but showered tons of reading matter down on the cities and then moved on to other population centers to repeat the performance. The polls closed at 4:00 o'clock and all through the night thousands of anxious tellers counted the ballots. Connecticut was the first state to report complete returns. Shortly after midnight the Governor radioed to the President, "Connecticut votes one hundred and seven thousand, nine hundred and three for defense, one thousand, two hundred and four for yielding." State after state reported similar results and at noon Thursday, the President was able to announce that ninety of the ninety-one states had voted for defense and that the total vote was over eighty to one against acceptance of Russia's terms.

It was considered certain that Russia had secret agents in the United States, and that no censorship could prevent Leningrad from learning the results of the ballot, so no attempt was made toward secrecy and the results of the American ballot were broadcast on the general wavelength. A meeting of the military and naval heads of the United States, the British Empire, the South American Union, the Chino-Japanese Empire and the Confederate States of Europe was called at Honolulu and all of the smaller nations were invited to attend. The Chief of Staff of the United States presided.

The first step was the formation of the High Command. The South American Union insisted that the presiding officer be made supreme commander, but General Diesen refused the honor. He pointed out that strategical and not political factors should govern and nominated Field Marshal Van Hornung of the State of Haolland for the office. His choice was passed by acclamation. Secretary of the Treasury Melville of the United States was given charge of the financial operations incident to the war.

FIELD MARSHAL VAN HORNUNG ordered every anti-aircraft gun of the allied nations to be assembled near their population centers and served with radite shells. The aircraft were ordered to be held in readiness for the Marshal's orders at the airports and in addition to the radite shells and bullets with which

they were normally supplied, he ordered that the bombers be laden with vacite and uranite bombs from the central storehouse at Berne. These powerful engines of destruction had never been used and had, by common consent of the nations, been placed in storage at Berne and guarded by an international police force.

Both operated on the principle of the disintegration of the atom. The vacite bombs destroyed the air and would produce a complete vacuum for several hundreds of yards around their place of explosion or "point of burst," and it was confidently expected that they would destroy any aircraft within the radius of their action. Uranite was a substance somewhat allied to the common radite, but immensely more powerful. Its action was to start a progressive atomic disintegration in anything other than air with which it came in contact. It operated only under the influence of light and so could be safely handled and stored in lightproof containers.

By Friday night everything was in readiness. Early Saturday morning a Polish air-scout reported the Russian squadron as crossing Warsaw at a height of ninety thousand feet and headed east at a speed of fifteen hundred miles an hour. The Russians ignored Europe and even the crowded purlieus of London and winged their way across the Atlantic, followed at forty thousand feet by thousands of European aircraft under the personal command of Van Hornung.

When the Soviet fleet reached New York, they sailed around over the city at an altitude of one hundred thousand feet as if to show the allied air navies that they could accomplish their purpose without exposing themselves. Van Hornung ground his teeth and swore, and shaking his fist toward the sombre craft, he dared them to come within range of his guns.

As though they heard the challenge and wished to show their contempt of the puny efforts of their assailants, slowly and majestically the four invaders dropped to the level of the other craft. Lower and lower they came, firing not a shot to oppose the storm of radite shells that was being hurled at them. At the five thousand foot level they took up their line formation.

At a signal from the Field Marshal, the allied fleets ceased firing and four huge Muhlenberg bombers rose sluggishly into the air. Up they went until they gained an altitude well above the Russians, and then they moved forward and took up their stations, one over each of the invaders. The Soviet craft dropped no bombs and did not fire a shot to oppose them, but waited motionless in the air for the attack.

A signal flew from the Field Marshal's ship and from each of the bombers fell a two-thousand-pound vacite bomb. Quickly the bombs gained momentum and fell straight toward the Russian fleet. The aim of the bombers was true and each bomb exploded a few feet above the craft at which it was aimed. The allied fleet watched with bated breath, but, instead of falling to destruction as had been expected, the invaders were not even shaken. A terrific clap of thunder sounded as the air rushed in to fill the vacuum created by the bombs and several of the allied fleet narrowly escaped destruction, but the Soviet fleet was no more affected than they had been by the rain of radite shells.

"Useless!" gasped Van Hornung. "Tell one of the bombers to drop a uranite bomb. It is our only chance!"

In response to the signals, three of the Muhlenbergs drew off while the fourth rose a thousand feet and from the higher elevation dropped a uranite bomb. The aim was perfect again and the terrible engine of destruction hurtled down, rapidly increasing its velocity. Just above the Russian ship it exploded, scattering the flaming uranite in all directions. The Field Marshal watched with straining eyes and a prayer on his lips. The fabric of the doomed ship should have shivered and dissolved in a burst of flame, leaving no trace in a few moments of its existence, but no such thing happened. The flaming uranite dropped slowly toward the ground, dissipating its energy in whorls of light. One of the shooting specks struck a French aerostat, which had incautiously ventured too close, and in a few moments the luckless ship and its crew ceased to exist. The Russian ship remained stationary and unharmed.

"God pity New York when that stuff lands," muttered the Communications Officer of the allied flagship.

"It will dissipate its energy in three thousand feet of fall in this sunlight," replied Van Hornung. "Were it not for that fact, I should never have dared to use it."

The Russian ship remained motionless.

"What are they waiting for?" exclaimed the Field Marshal.

As if in answer to his question, the communicator disc of the flagship began to glow. The Communications Officer pressed a key and a voice spoke.

"The Commander of the fleet of the Russian Union of Soviet Republics presents his compliments to the Commander of the Allied fleets and would like to know whether he has exhausted his resources."

"Don't answer him," cried Van Hornung.

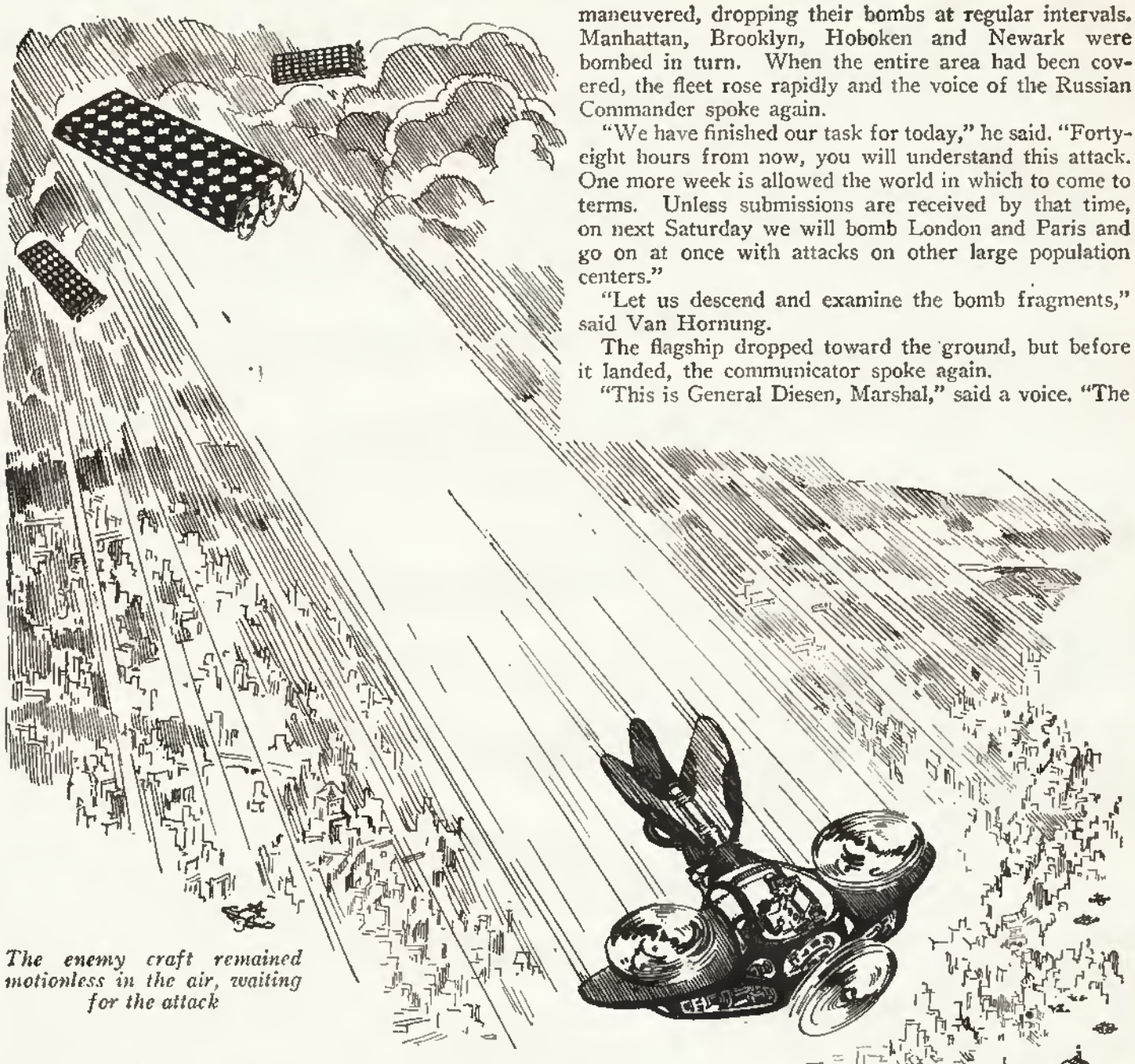
"If he has other attempts on us that he would like to make," went on the voice, "we will remain motionless and allow him to make them before we start our bombing. I wish to assure him that we will give him every chance, for we wish him and the whole world to know how helpless they are against us. Unless we are requested to remain in position for a new attack, we will commence bombing in five minutes."

"Ask them to stand by for a new attack," snapped the Field Marshal. "Send a general call to the fleet for an officer in a one-man cabin aerostat to volunteer for absolutely certain death."

The call went out and a dozen answers came in. The Field Marshal selected a Japanese flyer and ordered him alongside for secret instructions. In a few minutes a one-man Takasi, an aerostat, came up and the beady-eyed pilot saluted and requested orders.

FROM the flagship he proceeded to one of the Muhlenbergs where a uranite bomb was loaded into his machine. With his deadly load on board, he rose and hovered over the nearest Russian ship. He decreased the speed of his elevating fans and gently as a feather he settled toward the Russian. Lower and lower he went until he was only a few feet from the top of it. Here his downward motion stopped as though he had struck solid ground. His elevation fans ceased to turn, but still he remained poised a few feet above the huge black monster. Then he performed a deed that ranked forever the name of Hamashuri Kuriki among the immortals. Deliberately he detonated the bomb which he carried. His ship disappeared in a flash of light and spirals of flaming uranite flew in every direction, but the Russian was unharmed. The Field Marshal groaned.

"There is nothing more that I can do," he said in a heart-broken voice. "Send out the orders for a general retreat and order New York to keep under cover."



The enemy craft remained motionless in the air, waiting for the attack

As the allied fleet slowly and sullenly drew off, the voice of the Russian Commander spoke again in Van Hornung's cabin.

"Thank you, Field Marshal," it said ironically. "You will now be the witness to a modern first-class bombing of an undefended city. If you care to stand by to study the technique, I give you my word that you will not be harmed."

As the voice ceased, a signal flew from one of the Soviet craft and simultaneously four bombs fell toward the doomed city. The Field Marshal hid his face in his hands while tears rolled down his cheeks. The Communications Officer watched the bombs through a field glass.

"They're duds, Marshal!" he exclaimed suddenly.

Van Hornung grasped the proffered field glasses and looked downward at the city. Each bomb had burst when it had fallen, but instead of the flaming horror of uranite, nothing resulted from the burst but a puff of fine dust. The bombs were dust loaded as were the ones which the Russians had launched on their first attack.

Forward and back across the city the Russian fleet maneuvered, dropping their bombs at regular intervals. Manhattan, Brooklyn, Hoboken and Newark were bombed in turn. When the entire area had been covered, the fleet rose rapidly and the voice of the Russian Commander spoke again.

"We have finished our task for today," he said. "Forty-eight hours from now, you will understand this attack. One more week is allowed the world in which to come to terms. Unless submissions are received by that time, on next Saturday we will bomb London and Paris and go on at once with attacks on other large population centers."

"Let us descend and examine the bomb fragments," said Van Hornung.

The flagship dropped toward the ground, but before it landed, the communicator spoke again.

"This is General Diesen, Marshal," said a voice. "The

Surgeon General of the United States Army witnessed the bombing by television and he believes that a disease germ offensive has been launched. The President requests that you release the American flyers from your command in order that a rigid quarantine may be enforced until the matter is settled."

The death and disease rate in New York were normal on Saturday and Sunday, but on Monday morning the communicators all over the world began to glow, and the authorities of the hapless city were begging for serums. An exceptionally severe form of lobar pneumonia had broken out all over the metropolitan area. At six A. M. two hundred thousand cases had been reported. By ten the number had grown to over a million, and by noon the task of trying to keep track of the number of the stricken was abandoned. Practically the whole population had contracted the disease and appeals flew far and wide for doctors and nurses, but above all for serums, the only thing that would save the city.

The world's supply was rushed to New York and the laboratories everywhere strove with their crippled supply of rodents to keep pace with the demand. The amount available was pitifully inadequate, for anti-pneumonia serum would not store, and in order to be of value must not be over forty-eight hours old. Every laboratory kept a stock on hand, making it fresh daily, but the whole supply that could be located was less than a half a million tubes. Had the normal supply of guinea pigs been on hand, there would have been hope, but it was soon evident that seventy-five percent of the population of the infected area was doomed.

The leading surgeons of the world gathered at The Hague to discuss the problem, but nothing resulted, and at the end of the week it was evident that, were the Russians to carry out their threat and bomb the other population centers, nothing could save them. A hurried exodus took place from London and Paris. The conference of surgeons adjourned with the words of Zitali of Florence echoing in their ears.

"Gentlemen," the fiery savant had said, "there is only one hope. The tularemia, which is rapidly eliminating the rodents from the world, has not been checked. Even were we to check it to-morrow, it would take years of breeding to supply our needs. Devote your entire energies to finding some animal which you can substitute for the tiny rodents we have been using.

"There is but one man I know who could solve the problem, and that is Balinsky. Before he threw in his lot, heart and soul, with his country, he did even more wonderful things, and I know the man well enough to be sure that he has not turned the plagues of tularemia and pneumonia loose on the world without having a card up his sleeve which would solve the problem. Were he on our side, I would rest easy. If we only had Balinsky.

"Do your best, gentlemen. There is a solution, if you can find it. If you can find an animal that will replace the rodents we do not have, we may yet successfully combat the contagion. If you do not——" His silence was eloquent.

Among the physicians leaving the conference was a fiery-eyed young zealot from the smitten city of New York, named Boris Vestoff. As a child he had escaped with his parents from Russia and had taken refuge in New York, where his sister had been born and where his parents had died, as an aftermath of the starvation they had met with in Russia before they escaped. Boris Vestoff had followed his father's profession of surgery, and young as he was, his reputation was good, and many an older man envied him his skill and his prominence.

HE had escaped the contagion which held the city of his adoption in its grip and he had come to the conference to tell the world of the terrible things he had seen. He had seen his colleagues drop like flies and die almost unattended, for there were more sick than well, and those who were stricken were forced to do for themselves or to die neglected. His heart had ached with the dolor of stricken humanity and then, when it seemed that he had no more heart-strings to rend, he had seen the nurse in whom his whole future was wrapped sicken and droop. She had been at death's door when he had given her the small immunization dose which all unstricken surgeons were supposed to take daily. It had checked the progress of the disease, but it was too small to cure, and when he had steeled his heart and left her to attend the meeting at the call of duty, it was with every expectation that by leaving her, he had sealed her death warrant.

As he left the room his eyes burned like hot coals and he murmured to himself, "Balinsky—if we only had Balinsky." He climbed into the speedy two-passenger Spadile flyer, which the government had placed at his service, and split the air at top speed back toward New York, muttering again and again to himself, "Balinsky—if we only had Balinsky."

A different sort of a conference was taking place meanwhile in Saint Louis. Field Marshal Van Hornung had summoned the military and naval chiefs of the world to meet with the leading scientists and electricians to attack the problem of preventing future raids.

"Gentlemen," he said when the conference had assembled and its purpose had been made clear, "this whole matter is beyond my experience. I was a young man when the last war was fought in 1914 to 1918 and I saw then the first crude aircraft that battled overhead. I early saw the future of the sky warrior and I have for four decades advised my country and later my state to concentrate on newer and more powerful types. I am called the greatest authority in the world on aerial warfare, yet I confess myself to be helpless. A ship that has no apparent ceiling, that cannot be harmed by gunfire and that is impervious to vacite and even to uranite, is beyond my comprehension. I have seen and yet I cannot believe. To you gentlemen I turn for wisdom. How is it done?"

Professor Olsen of the University of Stockholm rose.

"Your Excellency," he said, "that it is a conquest of the forces of nature beyond the experiences of all present goes without saying. Which force it is they have mastered, I am not sure, but I believe it to be magnetism."

"Isn't it more likely to be gravity?" asked an Admiral of France.

Professor Olsen smiled.

"Gravity or magnetism, call it which you will," he replied. "As long ago as 1929, Einstein proved that magnetism and gravity obey the same laws. A few years later, LaRue proved experimentally the identity of the two forces and showed that gravity was merely an extension and generalization of the force of which magnetism is one localized effect. It is my opinion that the Russians have learned some method of either screening

or neutralizing the gravity or magnetism of the earth, or of producing a magnetic field of their own of opposite polarity to the earth force of enormous local power. That is the only explanation that I can give."

"But what is gravity?" persisted the Admiral.

Professor Olsen shrugged his shoulders.

"You ask a question that no one can answer," he replied. "We know the effects and manifestations of gravity and the laws which it obeys, but as to what it is, no one can tell you."

"I can!" broke out a voice from the rear of the hall.

All heads turned toward the interrupter. A young man in the uniform of an aide to the Chief of Staff of the United States Army was on his feet.

"I can tell you what gravity is!" cried the Aide.

"Silence!" "Order!" "Put him out!" an excited chorus rose in the hall. General Diesen struggled to his feet.

"May I beg to be heard?" he cried.

Field Marshal Van Hornung rapped smartly on the table. When order had been restored, he turned to General Diesen.

"What is it, General?" he asked.

"I would like to beg that my aide be given a hearing. Major Hamilton is a young man and, since all of his experimental work has been done in the army, he is not well known, but when I tell you that we consider him as our leading authority on wave motions and that he developed the portable television projector, which we are now using, you will realize that his talents demand a hearing."

"The conference will listen to Major Hamilton," ruled the Field Marshal. "Major, can you tell us what gravity is?"

"I think that I can, sir," replied the Aide, "but I must request your close attention and a minimum of interruption until I finish. Then I will be willing to answer questions. I believe that gravity is a wave motion."

"Bosh!" cried a voice. Field Marshal Van Hornung was on his feet in an instant.

"If there is another interruption of that sort, the interrupter will be dealt with under military discipline," he thundered. "When Major Hamilton has finished, you will be allowed to express your approval or your disapproval. Until then we will have silence."

The drop of a pin would have been clearly audible in the hall. Major Hamilton resumed.

"ANY motion, for example the passage of a body on a horizontal plane before an observer, will produce disturbances. These disturbances, so far as present science knows, are two in number: first, the disturbance of air particles in the immediate vicinity of the motion, and, second, a disturbance in the ether, that imponderable fluid which is assumed to fill all space and to permeate all substance.

"Provided that the disturbances are periodic, that is, that they come at regularly repeated intervals, both of these disturbances will be simple harmonic wave motions and subject to the well-known laws governing such motions. In each case the wave will have, besides an amplitude, a frequency and a length, the product of which will be a constant. This constant for the disturbances of air is approximately 1,140 foot-seconds, the velocity of sound in air. The product in ether disturbances is approximately 186,000 mile-seconds, the velocity of light.

"If, for the sake of illustration, we assume that we have a machine gun set up, firing bullets across a line directly in front of our eyes, and assume further that these bullets will always be equidistant from one another, no matter what the velocity of them may be, it is easily seen that the frequency of the disturbances will be proportional to the velocity at which the bullets are traveling, and the wave length inversely proportional to that velocity.

"We will start our gun firing with a velocity of four feet per second and assume that the bullets are one foot apart, a distance which is to be rigidly maintained, regardless of the subsequent velocity which we may assume them to be traveling at. Is my meaning clear? This is an important point."

"As I understand it," said the Admiral, "the bullets are to be always one foot apart, so that if you say the velocity has been increased to one hundred feet per second, we are to assume that the gun is then firing one hundred shots per second and so on."

"Precisely," said Major Hamilton. "We are starting with a velocity of four feet per second, so that as the bullets are one foot apart, there will be four disturbances per second. As the velocity is such that the eye can readily retain the impression, a stream of bullets will be plainly seen passing in front of the eye. No sound will be heard because the period of frequency of the sound wave generated is below the perception of the auditory nerves. No light will be seen because the frequency of the etheric disturbances is below the perceptive faculty of the optic nerve. A glass plate placed in the path of the bullets will be shattered, the cracks radiating from the point of strike in all directions.

"Suppose now that we increase the velocity so that two hundred and fifty-six per second pass a given point. As the Admiral pointed out, the gun will then be firing two hundred and fifty-six times per second and the bullets will still be one foot apart. The velocity of these bullets has now risen so high that the eye can no longer perceive them by direct vision and the frequency of the etheric disturbances is not yet high enough to affect the eye. As far as sight is concerned, these bullets are now non-existent. However, there will be perceptible to the ear a sound note, continuous and sustained, in pitch, middle 'C,' as the air particles vibrate two hundred and fifty-six times per second. A plate of glass placed in the path of the bullets will, in all probability, have a small hole in it with cracks radiating from the hole in all directions, but the plate will not be shattered.

"Let us now gradually increase the velocity until twenty thousand bullets per second pass a given point. The sound note heard by the ear is gradually increased in pitch until it is a shrill scream, barely audible; in fact, some ears could not hear it. A sheet of glass placed in the path of these bullets would have a perfectly clean, round hole drilled in it, as if it had been filed, and sparks would be seen to fly from the point of impact.

"Suppose that we double the velocity so that forty thousand bullets per second pass before the eye? The sound note has now risen to such a shrill pitch that the ear cannot detect it, while the frequency of the etheric vibrations has not yet risen to a sufficiently high figure to be discerned. To both the eye and the ear, these bullets are non-existent, although the glass plate placed in front of them would show the same phenomena as before.

"Since the air vibrations have risen to such a pitch that

they cannot be detected, the air no longer serves its purpose as a medium for perception. Therefore, in order to eliminate the enormous friction which would exist between the air and a body traveling at such a velocity, let us consider the air to be exhausted and the bullets to be passing through a perfect vacuum. By perfect vacuum I mean a vacuum containing ether and nothing else.

"Again increase the velocity until one hundred and fifty thousand bullets per second are passing before the eye. No evidence can be found by either the eye or the ear that these bullets are in existence. However, the etheric disturbances have now risen to such a pitch that if a radio receiver be tuned in, it will register a wave with a wave length of about two thousand meters. If a glass plate were now placed in the path of these bullets, a very clean hole would be drilled in it, and on examining the hole you would find that the portion of the glass contiguous to it had been fused by the enormous friction of the bullets rubbing against it.

"Let us now enormously increase the velocity until millions of bullets per second are passing. The wave length has now grown so short that the radio receiver will no longer register a note, but if a lens be placed in such a manner as to concentrate any emanation from the bullets' path and at the focal point of the lens, a thermocouple attached to a pyrometer or to a galvanometer be placed, the instrument will register. This shows that the etheric vibrations have risen to a high enough frequency to produce an infra-red ray. The infra-red rays are heat rays of a length just below the visible spectrum.

"INCREASE the velocity again, and a dull red glow in the path of the bullets will be seen by the naked eye, as the frequency of the etheric vibrations rises to a point where they will affect the optic nerve. If a glass plate be now placed in the path of the bullets, the glass will simply disappear, the material being made liquid by the enormous heat generated and flowing over the surface of each bullet in turn and adhering to it.

"Once more increase the velocity, and the dull red beam of light will change in succession to orange, yellow, green, blue, indigo, and violet, through the visible spectrum. After the violet fades out, the eye can no longer perceive these bullets, and they are forevermore nonexistent so far as the eye and the ear can determine.

"Let us, however, fix a camera with a rock crystal lens focused on the path of the bullets and it will be found that the rays given off are ultra-violet and will affect a photographic plate.

"If the velocity be still further increased, there will come a time when the plate will be affected even through a sheet of black paper, as the frequency has risen so high that the waves have changed from ultra-violet to X-rays. A glass plate placed in the path of the bullets will still show the phenomena of simple disappearance and fusion around the point of strike.

"Again enormously increase the velocity and we will find that the bullets give off the cosmic rays which we can detect and measure. Beyond this stage, no matter how much we increase the velocity, neither the eye nor the ear, the radio receiver, the pyrometer nor the photographic plate can detect their passage. As far as we appeal to any experimental evidence which we can detect, these bullets no longer exist.

"Now for a final step let us increase the velocity of these bullets until their velocity is infinite, that is, until it is greater than any finite value that can be assigned to it. An infinite number per second will now be passing before the eye and the frequency will be infinite. As a result, the wave length of the resulting etheric disturbance will be zero. There is no known method of determining the existence of these bullets, and a glass plate placed in their path will show nothing. The molecules of the plate will merely open in front of the bullet and close in behind them. Each bullet from a mass has disintegrated into molecules, then into atoms, then into protons and electrons and then in turn into pure motion, which cannot be detected with any instrument which we have been able to devise.

"As to what the nature of this beam of energy would be, I leave it to your judgment. If my argument has been logical and coherent, you know already. However, I will remind you that it is well known that there is one enormous force existent in the universe whose nature is still more or less a matter of conjecture. That force is——"

"Gravity!" cried Professor Olsen, who had followed the argument with rapt interest.

"Precisely," replied Major Hamilton, "and therefore, by the process of elimination, I have arrived at the conclusion that gravity is nothing more nor less than pure motion or force unassociated with matter; in other words, a wave motion with a wave length of zero."

A burst of applause greeted him as he paused.

"Of course, if you are right and gravity is a wave motion, a screen could be made which it could not penetrate," said Professor Olsen. "Your theory, then, is that the black bottom of the Russian ships is composed of some substance that intercepts gravity."

"No," replied the Major, "it is not. Consider for a moment the density of a screen that a wave motion of zero wave length could not penetrate. It would have to have a density of infinity."

"Certainly," replied the Professor, "but a density of infinity seems no more fantastic to me than a wave length of zero."

"Pardon me, gentlemen," broke in the Field Marshal, "I am not a profound scientist like you gentlemen, and it is not at once clear to me why the density of such a screen would have to be infinity. Will you kindly explain?"

Major Hamilton turned to Professor Olsen.

"Will you explain, sir?" he asked. "I am about talked out."

"Gladly," replied the Professor. "I will try to put it in non-technical language. Of course, the shorter the wave length, the closer together must be the particles of the screen which can interrupt it. To borrow from Major Hamilton's excellent word picture; if we disregard, as he did, all media of transmission other than air and ether, a wave motion in the sound range could be stopped by tissue paper. If you can conceive of such a thing, conceive two concentric spheres of tissue paper separated by a vacuum with yourself inside the inner sphere. The tissue paper would stop the sound wave. When we get to the shorter waves, denser media are required. Thus aluminum will stop light waves, but it will not stop X-rays. Lead, which is much denser than aluminum, will stop X-rays, but is permeable to the cosmic ray. I will not enter into the complex mathematics involved, but suffice it to say that it is readily demonstrable through an extension of the permeability curves

which connect density, wave length and depth of penetration, that it would require a screen of infinite density to stop a wave of zero wave length."

"But why should it be impossible to make a screen of infinite density?" persisted the Field Marshal. "Is it not possible that these ships are thus equipped?"

"It is not possible, and I can prove to you by experimental evidence which you have seen that they are not so equipped," replied Major Hamilton. "In the first place, if a gravity screen were perfected, it would shut off all gravity above it to an infinite distance. In such a case, any aircraft which ascended above the screen would shoot off into space. No such phenomenon was observed. In the second place, no matter how small it was, such a screen would rapidly exhaust all atmosphere from the earth. The air above it would fly off into space and the surrounding air would rush in to fill the vacuum thus formed and would in turn be projected off. The mere fact that we can still breathe is a positive proof against the existence of a gravity screen."

"Then what is your explanation?" asked Professor Olsen.

"Simply this," said the Major. "The Russians have found a method of developing an artificial field of gravitational force of immense but purely local effect. With this they neutralize the gravity of the earth, not by shutting it off, but by opposing it with a greater and opposite force. Such a field of force would also account for the fact that we are unable to lodge uranite or any other substance on them. This field of force is sufficiently powerful to repel matter of all sorts."

"Your whole argument holds together well," admitted Professor Olsen. "The only thing left for you to do is to tell us how you propose to neutralize this field of force to such an extent that we can reach them with explosives."

"My proposed solution is this. In order to generate a force of zero wave lengths and consequently infinite frequency, a generator would have to be employed which revolves at an infinite rate. Such a thing I cannot conceive. However, we all know that it is a very simple matter to step a frequency of, say, sixty cycles up to two hundred thousand cycles. It is my belief that a primary power is generated by generators turned by atomic engines and is generated at a high but perfectly finite frequency, and is then stepped up by some apparatus which we do not understand to a frequency of infinity.

"Matter, as we have found, cannot pass through their field. However, it is well known that wave motions not only will pass through other wave motions but will also superimpose on one another. This superimposition, in the case of equal wave lengths, produces alternate bands of double intensity and absolute rest. If the interfering waves are light waves, the result is a series of alternate bands of light and dark which you have all seen in the interferometer. Again, if we can produce a wave of exactly the same frequency and place it in space half a wave distant, the result is complete rest, a phenomenon which you have all seen in physics laboratories where one sound is killed by another.

"If my theories are correct, the way to combat these machines is to build a generator which will produce a wave motion of very great frequency. This frequency must be capable of being varied within wide limits. If we mount this generator on an aerostat and approach one of these monsters, we may be able to tune the generator to the same wave length as their primary source of power. If we do, we can neutralize it by interference and stop their motive power."

"And the result would be?"

"That their field of antigravitational force would be neutralized and they would crash to the ground, or if we wished, they could be destroyed in the air by gun fire or uranite bombs."

"Major Hamilton, can you build such a generator?" asked the Field Marshal.

"I believe that I can, if I am given a free rein with both materials and assistants."

"And, by thunder, young fellow," exclaimed Professor Olsen, "I'll go along and help you if you'll let me."

AS Major Hamilton and Professor Olsen left the conference with full powers to take over the plant of the General Electric Company at Schenectady and use its facilities to develop the generator which the former had proposed, a two-passenger cabin Spadile aerostat rose from New York. In the driver's seat sat Boris Vestoff and beside him sat his sister, a strikingly handsome woman in the late twenties. The aircraft rose without lights and cautiously moved over the city at a low altitude. Quietly as the atomic engine ran, there was no way of stilling the etheric disturbance which it made and before the Spadile had reached the limits of the city, an aerial patrol swooped down from a higher altitude, its searchlight blazing.

"Down, Boris," said the girl softly.

Vestoff stopped his propeller and slowed his elevating fans. Obediently the little craft sank toward the earth, but the quarantine patrol was not thus to be dodged. The radiolite indicators of the instrument panel suddenly began to glow and Vestoff knew that his craft was in the beam of the powerful ultraviolet searchlight with which the scout was equipped. Simultaneously the disc of his communicator began to glow. Vestoff cursed softly and depressed his key.

"Wait a minute," said a sharp voice. "Who are you and where are you going?"

"I am Boris Vestoff, QSR-664-L-22," he replied. "I am on my way to Washington to report to the President of the United States on the conference of surgeons held at The Hague. Didn't you get the word to clear the ways for me?"

"I beg your pardon, Doctor," replied the voice. "I received no such orders. I did have orders passed on to me, that you were to have right of way this morning when you were returning from the conference, but I received no other word. I presume that you have a clearance slip from the general in command?"

"Certainly," replied the doctor sharply. "Do you want to see it?"

"If you don't mind, Doctor."

"Certainly I don't mind, but I will have to ask you to indorse the time and your name and identification on it, in order that you may answer for stopping a craft with a governmental clearance, when it is answering an urgent call."

"Your right-of-way light isn't going, Doctor," said the voice reproachfully.

"Of course not. Since when have private craft been equipped with right-of-way lamps? Hurry up and come alongside if you wish to see my credentials and please turn that confounded ultrasearchlight off. I don't want to be blistered to-morrow."

"I beg your pardon, Doctor, I didn't mean to burn you. I'll be alongside in a moment."

The headphones of the sound-locater were clamped to Ilga's ears. As the voice of the patrol commander died out, the instruments ceased to glow as the ultrasearch of the scout was snapped off.

"They're dropping," said the girl. "Now their propeller is off. *Now,* Boris!"

Vestoff threw the clutch of his propeller in gear and shoved his indicator to maximum speed forward. The propellers of his little craft churned the air for a moment and then the Spadile shot forward like a bullet.

"Hold tight, Ilga," he cried and thrust the lever controlling his elevating fans forward to maximum. The ship split the air at a speed in excess of two thousand miles an hour while it climbed at the rate of a mile in twenty seconds. Vestoff kept his eyes on the instrument board.

"They are climbing as fast as we are, Boris," said the girl, "and they are heading almost directly toward us."

Suddenly the instruments of the Spadile began to glow and Vestoff stopped his engines and let the little craft fall like a rock toward the distant sea. In a moment they were out of the beam from the ultrasearchlight. Again he turned on both elevating fans and propeller and turned the craft at a right angle to their former line of flight. He maintained the new course for eighty seconds and then swung left into his old course.

"We gained a good deal that time," said the girl.

Again the instrument board began to glow, albeit faintly. Vestoff did not touch his engines but pulled a horizontal rudder and the craft shot upward. He changed course instantly to the left and shot down like a bullet. Ten thousand feet below his previous level he straightened out into his old course and tore out across the Atlantic.

"They are almost out of hearing," said the girl.

"We are out of searchlight range," replied her brother. "We are safe now unless they can get hold of one of the Atlantic Patrol and have us headed off."

"We'll have to take that chance," she answered.

"It's not such a big chance at that," he said. "The heavy seagoing cruisers can't hold up to the speed of a Spadile and unless they were almost directly in front of us, we could avoid them. Keep the locator trained ahead and listen for elevating fans."

Ilga swung the locator around as her brother directed and the tiny craft tore on through the night.

Northeast it bore for an hour and then Vestoff turned east. Despite the heating of the cabin, both he and his sister felt the cold as their craft swung around on a great circle north of Iceland and the White Sea. Vestoff watched the map unrolling on his instrument board before him, a tiny spot of white light marking the location of the ship. When the map indicated that they were due north of the Kola Peninsula, he swung the ship's head to the south and bore down toward Leningrad, at the same time reducing his speed to five hundred miles an hour.

AN hour of steady going brought him within two hundred miles of the Russian capital and he decreased his speed to a hundred miles an hour and waited for a challenge from an outlying patrol. Presently the radiolite dials on his instrument board began to glow and Vestoff stopped his propeller and allowed his ship to drift. The button of his indicator glowed and he pressed his key and waited for the challenge.

"Who are you and what is your mission?" asked a gruff voice in Russian.

"I am Sergius Karnoff of New York, United States," he replied, "and my companion is my sister. We have fled from the tyranny of the rulers and seek refuge in the sun of liberty."

"By what authority have you come?" demanded the voice.

"Under the general invitation of the Commissar for Foreign Affairs."

"That invitation was rescinded two years ago."

"True, but we fled in the darkness from our oppressors and we seek relief and shelter at your hands."

"Is your aerostat armed?"

"No."

"Then remain where you are, while I ask for instructions."

In a few moments the voice spoke again.

"You are to be brought before the Officer of the Guard for examination," it said. "Have you an ultrasearchlight?"

"No, this is a pleasure craft and not a war machine."

"Then remain where you are until I get within sight. Turn on your lights."

Vestoff snapped a switch and a beam of light stabbed the darkness before him. In a few moments the shape of a ten-man patrol ship swam into view.

"Follow me closely and land beside me," said the voice. "What is your best speed?"

"This is a Spadile racer."

"Oh! Then I'll take you along at a good clip. Don't run past me."

In twenty minutes the Spadile landed beside the patrol ship and the officer in command came over with a detail of men.

"Follow me, comrades," he said.

Vestoff and his sister stepped out of their ship, which was immediately taken in charge by two of the Russians, and followed the officer. He led the way to a dimly lighted building and knocked at the door.

"Remain here until I return," he said.

In a few moments he returned and with a curt, "Follow me," he led the way inside.

Ilga and her brother found themselves face to face with a dark heavy-set man in a colonel's uniform. Vestoff brought his heels together and saluted. The colonel smiled approvingly.

"Who are you and what are you doing here?" he asked.

Vestoff briefly repeated the story that he had already told the scout officer while the colonel listened closely.

"You are welcome," he said when Vestoff had finished. "Of course, you will have to appear before the Commissar of Secret Police and satisfy him, but that may not be difficult, especially as I can readily smooth the way for you. You are a doctor?"

"I was a research fellow in serumology in Bellevue Hospital."

"Good, we can find use for you. Has the girl any special knowledge?"

"None."

"All the better. She is better looking than the average and she pleases me. I will take her for my wife. As my brother-in-law, the Commissar of Police will not

so readily suspect you. You may go now and the orderly will find you a place to sleep. The girl will remain here."

Ilga drew herself up haughtily.

"So your royal highness plans to do me the extreme honor to take me for his wife, does he?" she said with a scornful laugh. "I have heard that in free Russia women were allowed to choose their own mates."

"They are," exclaimed the colonel in surprise. "Surely you do not fancy that you can do better than take me, a Colonel of the Petrograd Guard? You do not understand the honor that I am conferring on you."

"I understand that I have chosen a man already, a man whose shoes you would call yourself fortunate to be allowed to shine."

The red mounted on the colonel's cheekbones.

"Hold your tongue, hussy, or I will take you for my woman without the formality of a registration with the Commissar of Marriages," he said sharply. "I presume that you have chosen Zaneff himself for your mate."

"I want none of that crippled fool," said Ilga proudly.

The colonel leaped to his feet.

"Silence, girl," he roared. "Another word like that and I will have you thrown into the guard-room to be shared by the moujiks of the guard."

"Shall I tell my chosen your words?" she asked lightly at the threat.

"Your chosen! And who may he be?"

"Balinsky!"

HAD Ilga suddenly changed into a canary bird before his eyes, the Colonel could have registered no greater surprise.

"Balinsky?" he gasped as though he could not believe her words. "Are you serious?"

"Not only that but Balinsky is awaiting my arrival."

"Ilga!" exclaimed her brother warningly.

"Balinsky is head of the Council of Seven, who are above even the Premier," gasped the Colonel. "Do you mean to tell me that he expects you?"

Her brother answered for her.

"May I speak to you for a moment in private?" he said with a meaning glance at the two guards who stood before the door.

The Colonel dismissed the guards with a word and turned to Vestoff.

"Speak," he said sharply, "and tell me what this means."

"I was one of the agents that Balinsky used in spreading tularemia in the United States," said Vestoff in an undertone. "I did not identify myself before, as we always work under cover. We are not known by face even to the Commissar of Secret Police. My sister is one of Balinsky's women and she accompanied me. We were caught in the quarantine and could not escape sooner to make our report. Lead us at once to him, for I know that he awaits us." Suspicion clouded the Colonel's face.

"If you are one of his trusted men, how is it that you do not know that he is away with the fleet?"

"I have had no direct communication with him for two weeks. We were expected long before this, and indeed we tried to escape last night, but a patrol intercepted us and we were forced to put back. My orders were to report at once upon arrival. Can the fleet be reached by communicators?"

"You should know that the communicators are silent when the fleet is out," replied the Colonel. "This is Friday night."

"Of course, and London is to be bombed to-morrow. I had forgotten the date. You may take us to his palace and Krelovitch will care for us. If you are still uncertain, look over these papers."

He handed the Colonel papers inscribed in Russian. The Colonel glanced at them and compared them with a sheet of names and numbers that he took from a safe. As he did so, his face cleared.

"I beg your pardon, comrade," he said respectfully, "but one cannot be too careful in my position, you know. I am sorry to tell you that Krelovitch is with the fleet as well. I will send you to the palace at once and you can await the arrival of Comrade Balinsky. He should be back on Wednesday.

"The raid must be more extensive than was first planned."

"It is. The fleet will bomb London, Liverpool, Edinburgh and Paris to-morrow; Rome, Constantinople, Alexandria and Cairo on Sunday; Calcutta, Delhi, Pekin and Hongkong on Monday, and Tokio, Manila, Sydney and Brisbane on Tuesday. On Wednesday they will take San Francisco, Chicago, Detroit and Philadelphia, and return that night."

"That should bring the bourgeoisie to their senses."

"If it doesn't, Zaneff plans a systematic extermination of the people of the United States, as an example. For these raids, Balinsky is using the same bombs that he used on New York, because pneumonia can be readily checked in any country which capitulates. If he has to comb the United States, he plans on using a form of tularemia somewhat like the kind he used on the rodents, and which cannot be checked."

"Good! That is the way to handle them. Will you take us to the palace now? We are tired and would like to rest."

"Gladly," said the Colonel. "Do you know Technikoff?"

"No, who is he?"

"He is Balinsky's new major-domo. I cannot leave my post, but I will send him a note by an officer telling him who you are."

"Thank you. I will mention your name to Balinsky."

Colonel Dourgieff's note was enough to reduce Technikoff to humble submission, and when Vestoff demanded a suite of two connecting rooms, it was quickly supplied. Ilga threw herself upon the bed and looked up at her brother.

"So far, so good," she said in an undertone in English. "It was fortunate that those papers you got from Karonoff fitted you so well. We would have been in a hole else."

"I was almost afraid to use them. Karonoff didn't tell me enough before he died to make me feel any too easy. He was delirious while he was talking to me and I couldn't be sure of the accuracy of what information I had. Then, too, I was afraid that the colonel would examine them too closely. I had to make quite a blur, when I changed them the little I did, but luckily he only gave them a casual examination and smearing them with oil did the trick."

"Are you going to try to do anything before Balinsky returns?"

"If opportunity offers, but I am not going to force

matters. Things are going entirely too well. The only thing that I want to find is that sound-proof room that he has and find out how to enter it."

"I may be able to help there."

"All right, but be careful not to rouse suspicion."

"I'll be careful, Boris. Good-night."

THE air battle of a week before was repeated over London on Saturday. The Soviet ships stood the ineffective fire of the Allied fleets with no attempt at reprisals and then systematically bombed the city and moved on to Liverpool. The Allied fleets did not follow. There was no use; the Russians were impregnable.

The balance of the program which Colonel Dourgieff had outlined was carried out. On Monday the British Isles were calling frantically to the world for aid in combating the pneumonia which had broken out, but their cries were unheeded, for every nation was soon faced with the same problem. The spirit of the world was broken and nation after nation sent hurried calls to Leningrad, announcing their willingness to surrender on any terms that the Soviets demanded. Only the United States, the British Empire and the Chino-Japanese Empire held out, the two former through an inborn inability to surrender, and the latter through a fatalistic disregard for human life.

In Schenectady the greatest technicians of the world toiled night and day on Hamilton's generator, but as the manifold difficulties of the task became apparent, they despaired of accomplishing the feat in time and despair settled over the country. Even the veteran Field Marshal Van Hornung, who had never surrendered, gave up hope.

"Even if we destroy them, of what avail will it be?" he cried in anguish. "Countless millions of lives will be lost and the plague is spreading more and more rapidly. Were we to annihilate the monsters, they would still in death defeat us. It may be better to yield and ask them to help check the plague."

"Not while there is a man left in the United States," replied the President. "They may wipe us out, but they'll never lick us."

On Wednesday night the victorious Russian fleet returned to Petrograd, their mission accomplished. The city gave itself up to wild rejoicing (by order of Zaneff), and when the enormous ships landed, a milling crowd strove to hoist the crews on their shoulders and carry them to the city.

Zaneff, surrounded by his guards, pushed his way through the throng and greeted Balinsky.

"Submissions are coming in from all sides, Comrade," he cried. "The world revolution is at hand when we shall set our feet on the faces of these dogs of bourgeoisie who have starved us for generations and grind them into the dirt!"

"Save that for publication," replied Balinsky crisply. "Is there any outbreak of pneumonia in Leningrad?"

"No more than the usual amount."

"Good. I was afraid that it might spread from some of the infected areas, although I kept well away from the boundaries. Have you received any ambassadors yet?"

"I waited until your return. Sergius Karonoff has returned."

"Good. I want to hear his report. Did anyone come with him?"

"His sister."

"I didn't know that he had one."

"Why, she claims to be one of your women!"

"Is she good looking?"

"Very."

"Then she may be, even if she wasn't. It's probably some girl whom Karonoff picked up in America, whom he thought I might like and he told that story to protect her from you."

Zaneff smiled feebly.

"I would have left her for you," he said.

"Yes, if you thought that I wanted her," replied Balinsky. "Well, I'll go home and look her over. Notify the Council of Seven that there will be a meeting at the palace at nine to-morrow morning, or rather this morning, for it's after midnight. You had better wait in the anteroom when we meet. We may want to question you."

At the palace, Balinsky narrowly questioned Technikoff.

"His papers were in order, Excellency," said the major-domo. "I have never seen him before, but he knows what you have been doing and his sister is well acquainted with the palace."

"Oh, it's Karonoff all right," said Balinsky with a chuckle. "He has a good eye for feminine beauty, and he knows enough to keep the best for me. Where are they?"

"The girl is in the library. Karonoff went out to see you arrive."

"Good. I am going to the library and must not be disturbed on any pretext for the rest of the night. Tell Karonoff when he comes in to report to me at eight."

Balinsky entered the library and looked appraisingly at Ilga who returned his gaze unflinchingly.

"Who are you?" he asked.

"Ilga Vestoff of New York," she replied with a smile.

"How did you come here?"

"I helped Sergius to elude the quarantine patrol and as a reward he brought me here with him. I have passed as his sister and one of your women for protection."

"Didn't you know that it is dangerous to lie in Russia?"

"I DIDN'T think that I was lying much. I have heard that Feodor Balinsky appreciates feminine beauty and as my sole object in coming here was to offer myself to him, I did not think that he would refuse. In spirit, I was already one of your women."

Balinsky threw himself down on a settee.

"Such candor is refreshing," he said. "What is your object?"

"I desire power. How better can I obtain it than by ruling the man who rules the world? Besides, I know something that will bind you to me forever."

"What is that?"

"Do you wish to continue to live?"

The color faded momentarily from Balinsky's cheeks.

"What do you mean?" he asked sharply.

"Exactly what I say. Do you wish to continue to live?"

"Certainly. Why do you ask?"

"If you do, you must obey me. I know a secret that will save your life. If I do not speak to save you, you die."

Balinsky leaped to his feet.

"Speak!" he cried hoarsely. "Speak or I will call Technikoff and have the words tortured out of you!"

"As I have a glass capsule of cyanide under my tongue at this moment which I have only to crush with my teeth to cease to live, torture would not avail you."

"You would not use it."

"Do you see this body?"

Ilga rose and stretched herself languorously. The soft curves of her body, accentuated by the clinging garb she had chosen, brought the blood to Balinsky's face. He murmured a hoarse assent to her question.

"Do you think that I would care to live with it maimed and robbed of its beauty?" she asked scornfully. "When I have told you my secret, it will be my only hold on you and on the power I crave. If you want my secret, you will beg me for it."

Balinsky hesitated. Ilga ran forward suddenly and threw her arms around him and pressed her lips to his.

"I was merely teasing, Feodor," she said caressingly. "Of course I will tell you. I will tell you anything that you ask."

"Then speak!" he cried, his voice thick with passion.

"Not here," she said, drawing back.

"Why not?"

"Even the walls have ears. Here in the palace, unless report lies, you have a sound-proof room where none may know what goes on within its walls. There and there only will I speak."

"Then come!" he cried.

He led the way to a bookcase and twisted a knob. A section of the wall swung back and he motioned her to precede him through the opening. She started to enter and then drew back as though frightened.

"Go first, Feodor," she said in a coaxing tone.

He glanced sharply at her, shrugged his shoulders and stepped through the doorway. Ilga gave a swift glance around and slowly followed him. The room into which she stepped was severe in its plainness, the only furniture being a heavy desk in the center of the room on which showed a communicator button, and two straight chairs. Ilga passed him swiftly and leaned against the desk, facing the doorway through which they had entered.

"Are you sure that no one can hear what goes on in here?" she asked.

"I am positive. Unless the communicator is opened, a pistol shot in here would not be heard beyond this room when the door is closed."

"Close it," she directed.

"Turn that knob on the desk to the right."

Ilga did so and the door clanged shut.

"Now speak!" cried Balinsky. "You say that my life is in danger?"

"It is in grave danger. You can save it only by the most implicit obedience to my orders."

"From whom is it in danger?"

"You have not seen Karonoff since his return?"

"No."

"KARONOFF did not return. He was in New York when the fleet bombed it and he was stricken with pneumonia. Before he died he became delirious and told who he was and what was his mission. He was overheard by a man who speaks Russian like a native. This man took his papers and altered the description and came here, passing himself off as Karonoff. It is from him that your life is in danger."

Balinsky stared at her.

"Why did you not expose him sooner?" he demanded.

"Because I wished to save your life. By exact obedience to my orders you can save it."

Balinsky snarled and started toward her, his face distorted with rage.

"Where is this false Karonoff?" he cried.

"Look behind you!" replied Ilga.

Balinsky whirled as though shot and looked into the muzzle of a heavy revolver in the hands of Boris Vestoff. Ilga's laugh rang out in the stillness.

"Trapped!" she cried. "Feodor Balinsky, master of the world, arbiter of life and death for millions, trapped in a sound-proof room and at the mercy of Tiberius!"

Balinsky grew pale as he looked into the threatening muzzle.

"What do you want?" he demanded in a voice which quavered slightly, despite his heroic attempt at self-control.

"That will appear later," replied Vestoff quietly. "Sit down in that chair. Tie him, Ilga."

He tossed her a coil of rope which he held in his left hand and Ilga bound Balinsky firmly in the chair.

"Shall I gag him, Boris?" she asked.

"No, let the rat squeal. Now, Feodor Balinsky, you are face to face with your maker. On the promptness and completeness with which you answer my questions depends your chance for life. The first question is this: We know that you have prepared an anti-virus for pneumonia which will store and which you now have ready for use. Where is it kept?"

A stubborn expression came over Balinsky's face.

"What do you want of it?" he asked.

"Don't ask questions; answer them."

"I won't tell you."

"I will give you thirty seconds in which to answer me. If you do not, your blood is on your own head."

"If you kill me, you will never learn," exclaimed Balinsky. "What can I offer you to obtain my release? Power? You shall be one of the Council of Seven. Wealth? The world shall pay you tribute. Women? You shall have as many as you wish with all of the world from which to choose. Name your price."

"Ilga," said Vestoff in a cold voice as he handed her a knife, "remove his shoes and socks and slit his trousers up to the knees."

"What are you going to do?" cried Balinsky, the sweat standing in beads on his forehead.

"I am a skilled surgeon, Balinsky. As you are a surgeon, you will, no doubt, appreciate my motives. I have always wished to dissect the body of a living man without anesthesia in order to study the muscular reactions. This is my first opportunity. Since your life has become forfeit, it is well that observations of value to mankind result from your death. You should watch me with scientific interest, Balinsky. I am called a skillful operator."

Fascinated in spite of himself, Balinsky watched Vestoff take from his pocket a small operating kit and spread the gleaming instruments out on the desk.

"It is no part of my plan that you die of blood loss," he remarked as he adjusted a tourniquet to Balinsky's leg. "However, since you are to eventually die, I will not bother overmuch with asepsis. My first operation will be to remove the skin from your foot and ankle. I will then amputate your toes, one at a time and finally remove your foot at the metatarsal joint. Then I will start on the other foot. Observe the skill of my movements."

HE took a scalpel and slit the skin on the top of the foot. Starting at the slit he began to remove the skin and expose the muscles and nerves. His movements were skillful and careful, but very slow. Balinsky writhed futilely at his bonds and his screams of pain filled the sound-proof room. Vestoff went methodically along with his work, but Ilga stopped her ears with her fingers.

"I will now take off the large toe," announced Vestoff casually. "I trust that you are enjoying the exhibition."

"Stop!" screamed Balinsky, "I will tell you."

Vestoff straightened up.

"Really?" he said with a tone of mild interest. "I hate to interrupt my experiments. However, I suppose that I must keep my word. Where is it?"

"In the safe in my private laboratory."

"And the combination of that safe?"

Balinsky maintained a stubborn silence and Vestoff picked up the scalpel. As it touched his raw flesh, Balinsky spoke.

"Right to eighty-four, left three times to twenty-six, right twice to eleven, left to forty-four and right to open."

"And which serum is it?"

"The bottle marked '3-X'."

"Very well. Ilga, you will go to the safe and bring the serum here together with a syringe and a needle. Balinsky, if you make a sound while that door is open, I will remove your right eye next."

Ilga returned in a few minutes with the bottle of serum and a hypodermic syringe.

"Will this serum immunize as well as cure?" asked Vestoff.

"Yes. Give three minims as an intravenous injection."

"Since I fear that the exposure to which you have been subjected may cause you to contract pneumonia, I will first immunize you, Balinsky," remarked Vestoff as he filled the syringe.

As he approached the bound man needle in hand, Balinsky shrank back in horror.

"No, not that," he moaned.

Vestoff paused.

"Ah," he exclaimed with a smile, "I expected as much. I really am not stupid, Balinsky. Which is this, cancer or leprosy?"

"Bubonic plague," muttered the prisoner.

"Now perhaps you will tell us which is the anti-pneumonia serum," he said.

Balinsky shut his lips stubbornly and shook his head.

"Then I will inoculate you with this before proceeding with my operations," said Vestoff.

As the needle of death touched him, Balinsky shrank back as far as he could. Vestoff pressed the needle slowly forward with a grim smile. Just before his skin gave, Balinsky cried out.

"I will tell," he exclaimed.

"Very well," replied Vestoff withdrawing the needle. "Which is it?"

Balinsky hesitated and Vestoff touched him again with the needle.

"It is in the locked compartment of my safe," moaned the tortured man. "The keys are in my pocket. It is in tubes and is the only serum in that compartment."

"Get it, Ilga," directed her brother.

When she returned with the serum, Balinsky submitted to an injection without protest.

"That is satisfactory," said Vestoff. "However, there are several things left for you to explain. There are only about three hundred tubes of serum here. Either you have a larger supply some place or there is some method of rapidly reproducing it. Which is it?"

"I won't tell. You have enough for yourself. Do with it as you please. I will say no more."

"I am glad that you are stubborn, Balinsky, remarked Vestoff as he picked up the scalpel. "You force me to remove one of your eyes and that is an operation that I have often wished to perform."

He seized the upper lid of Balinsky's right eye with a pair of forceps and with his scalpel started to remove it.

"I will tell!" screamed Balinsky.

Vestoff dropped the scalpel with an exclamation of annoyance.

"Really, Balinsky," he said, "you force me to forego all pleasure. Speak."

"Inject the contents of each of those tubes into the shoulder of a horse. In six hours you may draw his blood, coagulate it and wash the serum with a saturated solution of dimethyloxamide in ether and it is ready for use. The dose for a person is two minims for immunization and five for cure. The dose for a horse is sixty minims."

"Can the serum thus prepared be used on another horse to increase the amount?"

"Yes, but each time that it is used, you must double the time of waiting or double the dose, as it progressively weakens."

"Balinsky, I am really sorry that you would not let me pursue my experiments on unanesthetized operations. However, the world is waiting anxiously for this preparation, so we must leave you. One more question before we go; what is the secret of your new airfleet?"

"I don't know," said Balinsky earnestly. "Each of the Council of Seven has his specialty and does not pry into the work of the others. Nashky can tell you, but I cannot."

Vestoff picked up the scalpel again with a smile.

"No, before God, I do not know. You may inoculate me with bubonic plague, but I cannot tell you."

The scalpel cut the eyelid slightly.

"I cannot tell; I do not know. For the love of the Virgin, have mercy!"

"I think that he speaks the truth, Boris," said Ilga.

Vestoff laid down the scalpel.

"So do I," he said. "There is only one thing left. I will move you to the desk and there you will write out a pass that will allow us to leave Russia unhindered in our own machine."

"You will not leave me here bound to starve?" cried the prisoner.

"No, I will not. When we leave, we will partially cut your bonds so that you can free yourself in an hour or two of hard effort. If it takes you longer, you may lose your right foot from gangrene, due to the tourniquet, but I believe that you will be able to free yourself. If you do not, I will send a call to Zaneff from New York and tell him your position, so your eventual release will be assured."

With the pass securely buttoned in his tunic, Vestoff spoke again.

"Use your communicator," he said, "and order my Spadile to be brought to the palace roof fully charged and ready for flight. Try no tricks when your key is open, for I can both inoculate you with plague and

blind you before assistance could reach you. Order my ship equipped with a right-of-way light and an ultra-violet searchlight."

An hour later, the button of Balinsky's communicator began to glow and the Spadile was announced as being in readiness. Vestoff cut partially through the ropes that bound the prisoner and, followed by Ilga, left the sound-proof room with the precious bundle of serum under his arm.

Ilga maintained her composure while the pass was being examined and until the Spadile had reached the fifty thousand foot level. As Vestoff pushed the indicator of his propeller to maximum speed forward, she screamed once and then burst into hysterical laughter. Vestoff switched on his right-of-way light, locked his rudder and turned to her.

"Buck up, Ilga!" he cried as he grasped her firmly and pressed firmly and steadily on the nerve centers behind her ears. "You have done splendidly so far but we aren't out of the woods yet."

"I can't help it, Boris," she gasped between shrieks of wild laughter, "His screams——"

"Isn't that a ship after us?" cried Vestoff sharply.

The thought of danger drove Ilga's hysterics momentarily from her mind and she seized the earphones of the sound locator and pressed them to her ears.

"I don't hear anything," she said.

"I thought that I did," replied Vestoff with a silent smile. "Listen carefully while I press her to the limit."

FOR an hour the tiny Spadile tore on through the night. Once clear of Iceland, Vestoff turned his craft southwest and headed on a compass bearing for New York City. Hardly had he set his course than Ilga spoke.

"I hear motors behind us," she said.

"What type and how many?"

"Heavy concentrators. About four. I can hear no elevating fans, but propellers are turning at high speed and there is some sound that I don't know. Unless I am mistaken, it is the Russian fleet that did the bombing."

"No doubt. They would trust no ordinary craft outside their boundaries," said Vestoff as he crowded his indicator forward, striving to coax a little more speed out of the Spadile. Louder and louder came the hum of the motors of the pursuing craft.

"There is no question as to what ships they are," he said grimly. "I must have cut too nearly through Balinsky's bonds. I had better call for help."

He left his ship to take care of itself and pressed his communicator key.

"This is Doctor Vestoff of New York," he said. "I have just escaped from Russia with serums that will cure every case of pneumonia in the infected areas. I am hotly pursued by the Russian fleet. Put me through to the President of the United States."

"The President cannot be disturbed," came the answer in a few minutes.

"Damn you and your officiousness!" raged Vestoff. "This is a vital matter. Give me anyone in authority."

In a few moments a sleepy voice spoke.

"This is General Diesen," it said.

Hurriedly Vestoff told his story.

"Have three hundred horses and as many surgeons ready against my arrival," he finished, "and ask Field Marshal Van Hornung to send every available craft aloft. They can't harm these monsters, but they may delay them and confuse them enough to let me land."

"Everything shall be done, doctor," said General Diesen, the sleep gone from his voice. "What is your course and location?"

"Drop on a long slant to twenty thousand," he said when Vestoff had given him the information, "the Allied fleets will meet you and pass over you at about forty thousand as soon as they can get under way. As soon as the fleets have passed, drop again to five thousand. I think we'll stop them all right!"

Vestoff dropped on a long slant toward New York, his ultrasearchlight blazing beside his right-of-way light. The hum of the Russian motors came clearer and louder and his instruments began to glow faintly.

"Where are the Allied ships?" he fumed.

"There they come!" cried Ilga.

Far above them ship after ship flashed by, visible for an instant in his upturned searchlight. The Spadile was traveling faster than sound, but from far behind them, Vestoff and Ilga could see the flash of radite shells as the Allied fleet met the Russians and poured a rain of fire into them. Two hundred miles ahead the ultra-violet aircraft beacons of New York blinked a welcome and Vestoff reduced his speed and slanted down toward them.

Far behind him, Field Marshal Van Hornung looked through his fluoroscope detector and watched the battle in the air. The criss-cross gleams of the ultra-searchlights lighted up the sky, and the four Soviet craft could be seen forging relentlessly ahead, unheeding the rain of shells that were poured on them.

"Where is that ship of Hamilton's?" he asked anxiously.

"It's coming, Marshal," replied the Communications Officer. "With the weight it is carrying, it is slower than the main fleet. Here it comes."

INTO the beam of the flagship's searchlight sailed a huge transport aerostat. In place of the usual cabin, it carried on its upper deck two huge generators and pointing ominously forward was a long tube at the rear end of which the Marshal knew was a parabolic reflector and a wave projector. Forward the transport moved until it was almost under the first of the Russian craft. The tube swung upward and the roar of generators could be heard. The tone of the generators changed and ran up and down the scale as Hamilton changed the frequency of the wave motion he was generating. The Marshal focused his sound locator on the Russian ship and listened in an agony of doubt. Suddenly the Russian motors missed a beat, and as they did so the ship dropped like a plummet. It recovered almost instantly and resumed its even hum, but the Marshal's face lighted up with exultation.

"He's done it!" he cried. "What's he up to now?"

The transport aerostat drew out of the fight for a moment and started to climb. Once above the Russian ship, the long tube swung downward. Almost at once the hum of the Russian's generators ceased and like a lump of lead the ship plunged toward the ocean. Down and down it went. Van Hornung grasped the transmitter of his communicator from the hands of the officer who held it.

"Fire on that falling ship!" he shouted.

Heavy radite shells were on their way before his voice ceased. They crashed (*Continued on page* 521)

The Young Old Man

By Earl L. Bell

Author of "The Moon of Doom"

What science did for a young man in a moment of sad desire

WHEN we examine the amount of scientific progress that was made in the medieval ages, it is astonishing how little was accomplished. It is plausible to consider, as a very important reason, the rampant superstitions of those days and the readiness with which people who dared utter a word that was not generally accepted as gospel truth, were burned at the stake or otherwise executed as witches or aides of the devil.

It might prove of inestimable value if we could transcribe the hieroglyphics that compose the Roger Bacon Formulas which were lately supposed to have been discovered, for Bacon, the writer and Franciscan Monk, was also a scientist of no mean ability.

Mr. Bell, who is known to our readers as the author of "The Moon of Doom," has easily exceeded himself in this story on this theme of age-old interest and continued newness.

WE met the Young Old Man—Glenn Fleming and I—during our first camp-out in the heart of the Ozarks.

A cloudburst that sent the rain through the roof of our shack had ruined our *cache* of rations, and we decided to replenish at the nearest settlement, some ten miles distant, rather than cut short our vacation.

Our rackety car managed to carry us safely over the makeshift mountain roads, and we found that the settlement comprised only five or six scattered houses and one store, a typical cross-roads affair, whose front bore numerous patent medicine and cut-plug advertisements amid which could be discerned the lettering: CLINTON FANCHER—GENERAL MERCHANDISE.

Quite traditionally, the proprietor was sitting on a soap box inside the store engaged in the ancient art of whittling when we entered. There was something about him that focused our attention immediately he rose to greet us; and when he spoke, we knew he was no ordinary hillman.

"A particularly fine day after yesterday's deluge, my lads. One of the heaviest rains these old hills have had in more than a decade. What can I do for you?"

In spite of his inordinate quid of tobacco, his articulation was perfect, but there was an alien quality in his voice that was baffling—a slight but peculiar accent that defied definition. His English was good, but it hinted of other tongues, a combination of them, in a most cosmopolitan sort of way.

Queer, that voice of his, but his appearance was even more bizarre. I remarked him closely as he was filling our order and noted that Glenn, who had strolled over to the counter and picked up a book that lay by the cheese box, also was studying him.

There are men who are old for their years, and men young for their years, but there is always some clue—the eyes, as a rule—that enables one to come within ten years of their correct age, at the outside. But not so with the man before us. I first thought he was no more than forty. Then, noticing his graying hair and slight flabbiness of muscle, I guessed he was about fifty. But when I found opportunity to look closely into his eyes, I received such a shock that I wanted to shudder.

Set in a face almost youthful, they were ancient beyond reckoning, as are the Ozark hills.

Dewlapped, timeworn and sunken. . . . Yet they were not the lack-lustre eyes of senility. There were life and light in them, but of a kind I did not know. Weariness—infinite weariness—was there, and a sorrowful sort of wisdom, as if they had gazed too long upon the Valley of Baca. Still, I repeat, they were not the watery eyes of age. Rather, I fancied, they were orbs such as the Sphinx might have, should she rise suddenly to vigorous life, under doom to remember all. Yes, that was it—the storekeeper's eyes had seen too much, and were unable to forget.

I thought I had managed somehow to conceal my amazement, and was quite certain he had betrayed no embarrassment; but a moment later, none the less, he produced from his pocket a pair of dark glasses and put them on.

Glenn, registering puzzlement, was still thumbing the book when the grocer finished with our order, and when he laid the volume down, I noticed for the first time that it had no cover.

"Well, boys, I presume you are strangers in these parts," the merchant's enigmatic voice put in, as we paid him and made ready to depart. "And camping out, I deduce."

We introduced ourselves and informed him briefly that we were down from St. Louis for our first stay in the Ozarks, and were "roughing it" at Robin Creek, where the fishing had been very good until the recent rain.

"The water will be too muddy for any catch except catfish until to-morrow, I should say," he commented. "Come to see me again before you leave, lads. I seldom see anyone from the outside. I have been living here twenty years and haven't been ten miles from the hamlet in that time. I guess I'm getting lonesome—and loquacious. Sometimes I find myself looking out upon the hills and talking to them. I've seen nearly all the mountains in the world, boys, and I love the Ozarks best of all. They are so old they seem to be *en rapport* with one who has come to realize the futility of it all. They

Illustration by Briggs

¶ *I jerked spasmodically. I tried to free myself, but the devils in the wires were too cunning.*

were once quite haughty hills, you know, but the eons have worn them down. The day will come when they shall be no more. *Sic transit gloria mundi.*" (Thus the world's glory passes.)

"Then I take it you are not a native of this section, and must have traveled quite a bit," I said, hiding my astonishment at his linguistic display.

"You're right, my friend. My natal cry was uttered far from these hills, and I've outdone the Wandering Jew himself in my day. Come over some time and let me bore you with some of my experiences."

And then, to Glenn as we were starting the car: "You must come too, my lad, and I'll tell you about that book, if you'll promise to believe me."

"IMAGINE a country storekeeper in this neck of the woods using Latin and reading dog Latin. It's uncanny!" Glenn's voice rose above the rattle of the flivver.

"But not as uncanny as his eyes," I responded. "Did you see them?"

"No, I was too interested in the book. So that's why he put on his glasses?"

"I guess so, and I'm glad he did. His eyes really gave me the creeps. They're incongruous. At once young and old, and there's something odious about them—no, not that, but sadness and weariness so great as to make them repellent. I once read a gruesome tale about the dead-alive, a group of people for whose souls life and death fought to a stalemate and finally arrived at a ghastly compromise whereby their victims must live forever in a plight that called for death. Well, I imagine those people must have had eyes like those of our friend back there."

"Oh, wake up, Bill, you talk as though you had seen a ghost or a vampire," my companion chided. "The fellow has some peculiar optical ailment, that's all. But I'd like for you to tell me what he is doing with that book. It's a medieval philosophical work and is written in a monkish sort of Latin that puzzles me. There was no way to tell who wrote it, nor when it was published. The binding and the title page were gone, and the name doesn't appear at the top of the pages as in modern books. It must be hundreds of years old, and is worth a fortune, sure as your name is Bill Semms."

Glenn was a hopeless bibliophile, and I knew he would not rest until he had learned the history of the volume. Therefore I expected him to propose that we pay the storeman another visit, and he did so, before we reached camp. I prevailed upon him, however, to wait until we broke camp and stop by the store on our way out of the mountains.

A VISITOR came to our shack that night, an old mountaineer named Harkins who lived about a mile up the creek, and who had paid us a previous call. Long, lean, bearded and rugged, he was a typical back-hillman in all save one respect: he was garrulous—to a fault.

"Come down this way this mo'nin' bout noon to see ef the cloudburst had washed you all away," he said by way of greeting, "and found you-all gone. Reckoned you-all had packed up and hit fer home, but heard your car a-rattlin' over the hills while I was a-crossin' the creek this evenin' (afternoon), so I jest drapped in to tell you-all that the fishin' will be all right again in a day or tew."

"The rain was too much for our roof and ruined the groceries we had in the corner over there," I explained, "so we had to run up to the settlement and buy more."

"Which settlement?"

"I don't know its name. It's about ten miles west of here."

"That's Rossville. So you bought 'em from that Fancher fellow, hey? Pecooliar old chap, ain't he? They call him the 'Young Old Man.'"

Glenn moved closer and handed our guest a cigar.

"We didn't pay much attention to him," I lied, trying to veil my curiosity. "Why do you call him peculiar?"

"Ef you had saw his eyes, you'd a-called him wuss than pecooliar. Guess he had 'em covered up, though. Most gen'ly does, now."

"He did strike us as somewhat unusual," I admitted. "Tell us something about him."

"Well," he began, lighting his cigar, "Fancher ain't a bad sort o' feller—'ceptin' his eyes. Nobody 'round here don't know much 'bout him. He's a mystery. Come to Rossville 'bout twenty year ago and bought out a sto'. He's a furriner, all right, but nobody don't know jest where he come from. Friendly enough, but never would say much 'bout hisself, or 'bout anything else, for that matter. They do say, though, that he's kind o' loosened up here o' late. I ain't saw him in nearly two year."

He paused and stroked his beard.

"But his eyes—what's the matter with them?" I prompted.

"Nobody don't know what in tarnation's the matter with 'em. They was kind o' pecooliar when he fust come here, and they been gettin' wusser and wusser ever since. Got so bad 'bout five year ago that the young uns at Rossville thought he was the bogey-man and were scairt to go to his sto', even for the scraps o' candy he'd give 'em now and then. He started to wearin' a pair o' big black glasses 'bout that time, and I hyears he's sca-cely ever seen without 'em, now. He can see out o' them eyes o' his'n good as anybody, though."

"Why do they call him the 'Young Old Man'?" Glenn put in.

"I was a-comin' to that. It's mostly 'cause o' his eyes. Ef you had saw 'em, you'd understand. Bet old Methuselah hisself didn't have a set o' eyes any older lookin' than Fancher's. They look like they had saw the flood, the locusts and all them other plagues the Bible tells 'bout. Ef it warn't for that, he could pass for a man o' forty-five, easy. And that's the funny part o' it—'ceptin' his eyes, he don't look a year older than when he fust come here. Yes, sir, there's somethin' mighty pecooliar 'bout Fancher. But he's a pretty good sort, jest the same, and will do anybody a favor ef he can. The smallpox broke out in these parts 'bout ten year ago, and Fancher closed his sto' and nussed at least a dozen families. Didn't seem scairt at all."

THREE days later we heard the Young Old Man was dead.

Found lifeless in his bed in the room back of his store, according to old Harkins, who brought the news to us.

But the excited Harkins had no particulars. In fact, he wasn't certain the report was true. He had "hyeared" it, he said, and was preparing to go to Rossville to investigate. "Mought be a murder," he added, morbidly,

if not hopefully. "We ain't had no excitement in these hills in three year."

Glenn proposed that we ride over and see for ourselves. I surmised he was anxious about the fate of that book, but what he meant to do about it, if the owner was really dead, was more than I could fathom.

We invited Harkins to accompany us.

The coroner had claimed the body when we arrived, and there was to be an inquest shortly, the agitated villagers informed us.

A few minutes later, after Harkins had lost himself in the crowd, Glenn and I, accompanied by the coroner, viewed the Young Old Man's remains.

It was evident that he had died without a struggle. The body, fully clothed and face up, lay across the bed. His weird eyes were forever closed, yet there was something unearthly about his features—an expression of transcendent *joy* that centered in the strangest smile I have ever seen on the face of the dead. Not inscrutable, that smile. It told of long-sought surcease of flagellating weariness; of infinite gladness at having laid the burden down.

"I can't understand it," the coroner's voice interrupted my thoughts. "He looks like he is glad he's dead. A plain case of heart failure, I guess, but I must go through with the inquest soon as the doctor arrives."

The room of death was small and sparsely furnished. The bed, two chairs, a trunk, a table and a small oil stove were about all it contained. An oil lamp stood on the table, and beside it lay a coverless book and the Young Old Man's dark glasses. The walls were bare save for a cracked mirror on one side of the fireplace, and what appeared to be a framed motto on the other.

Glenn moved over and picked up the book soon as it caught his eyes.

"This is a valuable volume," he said to the coroner. "I would have given him a hundred dollars for it."

"Well, you may be able to buy it from Preacher Fellows," the official drawled. "I understand Fancher made some sort of a will a few months ago and left the pastor everything he had."

"Where does the minister live?" Glenn asked, eagerly.

"In that little white house over yonder," pointing out of the window to a cottage about two hundred yards away. "Preacher Fellows is a superannuated circuit rider, and is going blind. He was Fancher's closest friend."

Glenn laid the book down reluctantly and walked over to the motto on the wall.

"Come here, Bill, you and the coroner," he beckoned a moment later. "This is interesting."

It was not a motto. It was part of Walt Whitman's chant to death:

"Come lovely and soothing Death,
Undulate round the world, serenely arriving, arriving,
In the day, in the night, to all, to each,
Sooner or later, delicate Death,
Dark Mother, always gliding near on soft feet,
Have none chanted for thee a chant of fullest welcome?
Then I chant for thee, I glorify thee above all,
Approach, strong deliveress."

"SO you want to buy the book? I don't know its value, but I think the hundred dollars you offer is too much, my son. I'll take it, though, for God knows I'll need it before long. It's a strange volume, isn't it? Fancher used to pore over it all the time, but he'd never tell me what was in it."

We were sitting in the old circuit rider's humble parlor. It was night. The Fancher inquest had been late in starting and had lasted until nearly sunset. The verdict was death from natural causes.

Glenn gave the minister the money and we prepared to depart, but he entreated us to stay a little longer. It seemed that something was troubling him.

"I'm worried, my young friends," he admitted after a while. "There's something I want to show you. You say you are college men, and maybe you'll be able to help me."

He reached into a drawer of the small table around which we were sitting and produced a large envelope.

"I suppose I should have opened this before the inquest was held," he said, "but was so shaken over my friend's death that I forgot it.

"Fancher made a will shortly before he died, and his wish was that I sell his store and keep the money against the day when these cataracts have finished blinding me. The same day he drew up the will, he gave me this letter. I was to open it on the day he died. I had just finished trying to read it when you knocked at the door. My eyes are so bad I couldn't study it closely, but I read enough to make my reason totter. God knows I believe Fancher was insane when he wrote it—insane all the time—and we didn't know it.

"Here, my son," handing me the letter, "read it aloud. I want to know just what it means before I show it to the coroner. I'm just a plain old country preacher and know almost nothing about the things he mentions. But I pray that Fancher's story isn't true. A suicide's soul—no, I won't say that. Go ahead with the reading, son."

He turned the flickering flame of the kerosene lamp a bit higher, and this is what I read:

THE TRUE STORY OF THE LIFE OF
CLINTON FANCHER, 1269-1926

I, Clinton Fancher, *alias* numerous other names, be-

Sketch by Briggs

Set in a tall, almost youthful figure, his eyes were ancient beyond reckoning, as are the Ozark Hills.

ing in full possession of all my faculties and having determined to die, write this, my life story, on the day that marks the 657th anniversary of my birth.

Knowing that none will believe, I will be brief. And knowing that the English used by the old friar and myself is scarcely intelligible now, I will be modern.

I was born in the year 1269, in the ancient town of Basingstoke, which is in Hampshire, England.

It was in my twenty-fifth year that I met the thaumaturgist and traded life for *life*.

He was known as the Sorcerer, and I met him near Ilchester, in Somerset, in 1293, the year before he died.

He was an old man of nearly 80 then, and had returned to Somerset, the place of his birth, to spend his last days after a long imprisonment.

The sorcerer was a Franciscan of Oxford, and one of the most famous men of his day. A devotee of knowledge and a man of science, his renown had spread over most of Europe. He probably did more than any other man toward ushering in the Renaissance. He prophesied the airplane, motor vehicle, steamship, submarine and many other inventions which I have lived to see perfected. His scientific discoveries were among the first ever made by an Englishman. His writings marked him as probably the greatest philosopher since the Greeks.

So great were his accomplishments, that they proved his undoing and made of his life an intellectual tragedy. He had always been considered a rebellious member of the Franciscan order and was distrusted by his fellow friars. At length he was accused of dealing in black art, and finally, when the church condemned his books, was thrown into prison for fourteen years.

He had pursued his writings and investigations while in prison, and it was rumored he had emerged with the formula of an elixir that would enable one to live forever.

I had been ill three years with a disease which was later to become known as tuberculosis. I felt I couldn't live much longer. And I was in love. She was a bonny Hampshire lass with eyes like lapis lazuli.

And that is why I left Basingstoke and made my way to the house of the sorcerer.

He received me kindly, did this old friar of the broad brow and piercing eyes, whom prison suffering had wasted to a shadow.

"So you would like to live forever, my lad?" he asked after hearing my story. "I wouldn't advise it, even if it were possible. The man who discovers an elixir such as you mention would be the greatest malefactor the world has known. No, I have no such formula. Don't you see, I'd be burned at the stake for witchcraft if what you have heard were true?"

But I pleaded with him to try at least to heal me. I told him of the lass back in Hampshire. At length he promised to dose me.

"Come back to-night, my son, and I'll see what I can do," he said, a strange light coming into his eyes.

THAT light was burning fiercer when I returned. I was almost afraid of him. But he took me by the hand reassuringly and led me into his study.

"There is no drug that will heal you," he said. "You must waste away and die unless——"

"Unless what?" I cried.

"Would you really like to live indefinitely, my son?"

"Yes, forever—forever and a day."

"Yours is the voice of youth," he meditated. "You do not know what you say. I do not want the stain of a suicide's blood on my soul. The very knowledge that one had interminable life would lead to self-destruction. No, lad, life is usually too long as it is."

"But not for me," I protested. "I am only twenty-four, and must die—die without having lived."

"It is so," he agreed. The strange light in his eyes flared up again, brighter than the ray of the candle on the table between us. "Come with me."

He was trembling so violently he could hardly pick up the candle. "Come with me."

He led me into another room and pointed to a silver crucifix on the wall.

"You are of the faith?"

"Yes, Father."

"Then kneel before the crucifix and swear by all the saints that you will never reveal, while I am living, what I am about to do."

I swore.

When I rose he had opened a cleverly concealed trapdoor in the floor behind me. There was a ladder leading to the basement. I followed him down.

The cellar was not more than ten feet square. A table stood in one corner. On it was a sizable black box with wires running from it.

The old friar set the candle on the table and placed a hand on the box.

"I'm not certain it will grant you immortality," he said. "If I were, I would not have brought you here. But it may heal you, at least. And if it does more than that, may God forgive me."

"What is in it?" I gasped. Had Lucifer and all the hosts of Hell sprung from the box I would not have been surprised. You must remember that it was still the Dark Ages.

"Ah, that I knew what it contains," the old man replied. "But it has no life, as we understand the term. And it cannot harm you, though it may cause you to fall asleep for a while. Are you ready, my son? If so, bare your wrists and ankles."

The seeming necromancy of the proceedings almost paralyzed my medieval mind. Grim fear gripped me and for a moment I wanted to cry out and flee the house. Would to God I had!

That the sorcerer was in league with Satan I had no doubt. And probably he was trying to betray me into selling my soul. No, I told myself, I would have none of it. But at that instant the old man's eyes gleamed once more with that unholy light—hypnotic, I suppose—and my fear subsided.

Stupefied, I began rolling up my sleeves, and when the candlelight accentuated the emaciation of my arms, I no longer hesitated.

The sorcerer must have sensed my decision. He began fumbling with the wires that ran from the box, and I noticed there was a metal clasp at the end of each of them.

At his gesture I moved nearer the table and he fastened the clasps about my limbs. I fancied his lips were moving in prayer.

"Ready, my son?"

"Ready, Father, and God help me!"

There was a sort of key in one side of the box. The sorcerer gave it a turn.

A thousand fires began racing through my veins. I jerked spasmodically. I tried to free myself of the clasps, but the devils in the wires were too cunning. A sputtering sound was coming from the box, and my horror-dilated eyes beheld small streams of purple sparks issuing from the holes where the wires emerged. In spite of my pain, I was fascinated. I had never seen fire so beautiful, I thought, and thinking, lost consciousness.

I WAS stretched on the cellar's earthen floor when I revived. The sorcerer was bending over me solicitously.

"You are all right now," he said. "I'm sorry it hurt you. I did not know."

"How long was I dead?" I asked, rising and finding that the clasps had been removed.

"You slept only a few minutes. It was a slumber I don't understand."

I glanced at the box. It had ceased its sputtering.

"The devils in the box—where are they?" I inquired.

"There were no devils, my son. It was a natural force. Let's return upstairs—it's too damp down here—and I will try to explain."

"Yes, it was a natural force, my lad," when we were back in his study and I had sipped a glass of his wine. "The ancient Greeks called it *elektron*. Thales of Miletus experimented with it 600 years before Christ lived. I think it's the same phenomenon that causes lightning.

"I have gone much deeper into the mystery than did Thales—too deep, perhaps. I have learned how to produce it and partially control it. I have also discovered that it can kill, as does the lightning, and that, while it cannot produce life, it can prolong it *ad infinitum*.

"And since I have been out of prison I have made a prodigious step. *I have isolated its life element.*

"The fire you saw coming from the box, my lad, was literally the spark of life.

"I first applied the life element to species of the Ephemerida, insects that live only a few hours, and the result was that they lived for weeks. I next tried it on small animals, mostly mice, but it is too early to remark its effects on them. I noticed, however, that diseased rodents were immediately restored to health and that the same was true in the case of a dog that was nearly dead when it came into my hands.

"Therefore, my young friend from Basingstoke, I believe you need have no further fear of the disease that has been consuming you. And if the life spark has given you physical immortality, forgive me, my son, and curse me not in the dreary days to come.

"Go you back and wed the maiden, and my blessing be upon you and yours forever."

AND back to Basingstoke I hurried, leaving the house of the sorcerer the next morning and carrying with me one of his books which he had given me as a remembrance.

As I trekked my way homeward I knew I had been healed. I could feel life—new life—surging through me, bringing vigor I had never known, and ere I reached Basingstoke, firm flesh had filled out my frame.

But I was never to wed the lass with eyes like lapis lazuli; nor, through the more than six centuries that have followed, any other. . . . The spark of life, in giving life, had killed the life within me.

I remained in Basingstoke twenty years without aging a day in appearance. Then the townsfolk began to accuse me of having bartered my soul to Satan for eternal youth. I tried to explain. They laughed.

And then I began my wanderings, the loneliest, most accursed of mortals, an object of curiosity or suspicion wherever I tarried long; driven from clime to clime by fear and sensitiveness; an anachronism spurred ever onward by a life that prayed for death.

I was in Germany when the Black Death swept Europe; in France, that day in May when Joan of Arc was burned in the streets of Rouen. The Maid was a pathetic figure, weeping as she walked to the stake. And, seeking death in battle, I fought under many flags. I was with the German troops when they pillaged Rome; with Blake when he destroyed the Spanish fleet at Teneriffe; with the Royalists against Cromwell, fought against my native land when the American Colonies struggled for freedom; with it again in its wars against Napoleon. Wounded only once.

But I said I would be brief.

I have been in America now since 1880. Twenty years ago I came to the Ozarks, seeking sanctuary in their loneliness. My respite is ending. The friendly hill people have begun to wonder. They are calling me the Young Old Man—a name I have had in many lands. Even the children sense my anomalousness. They are afraid of my eyes.

It has been said in truth that the eyes are the windows of the soul. Mine reflect my weariness, if not my age. But it is only in the last few years that their incongruity has grown into gargoyle hideousness. The soul is bursting through the windows at last.

I am weary for oblivion. For five hundred years I have sighed for the waters of Lethe. But I have been a craven coward, afraid, because of the medieval superstition that still lies coiled in my soul, to summon death. An eternity of monotony behind me; centuries of memories that will not fade. An eternity of loathsome life before me. A thousand years of it, perhaps. A thousand years! It shall not be. I will not go on. If it is true that God has existed from eternity, I am sure He will understand.

I have the formula of a potent but kindly poison I have remembered from the Dark Ages. I will brew it soon and drink it, and drinking, sing out with the poet, "Approach, strong deliveress!"

The sorcerer, in the book he gave me, cried out against the futility of life. The name of the volume is *Opus Tertium*. I still have it, though I destroyed its binding and title page centuries ago when priestly prejudice still execrated the memory of its author, whose name was ROGER BACON.

THE END

Gold Dust and

By Cyril G. Wates

Author of "The Visitation" and "The Face of Isis"

Gold Dust and Star Dust

Illustrated by HYND

By Cyril G. Wates

Author of "The Visitation" and "The Face of Isis"

HERE is another story about a robbery perpetrated by means of the Fourth Dimension. But this time there are no forceps. Our well-known author can be depended upon to use an entirely new method, ingeniously devised. Only a detective well versed in the subject of the Fourth Dimension could possibly have solved the mystery—yet it all seems very simple after he explains it.

¶ *A hundred massive oak cases were hanging in the air and occupying a space not larger than an orange! It was like looking at them through the wrong end of a telescope.*

WHEN the telephone rang and I found Hilary Corwin waiting to speak to me, I knew at once that something quite out of the ordinary had occurred. His voice, usually firm and slightly emphatic, as of one who is in the habit of imposing his views upon others, now trembled with excitement. His eyes snapped and sparkled and there was a hectic spot of crimson on each high cheekbone.

"Can you come up to the lab immediately, Frank?" he said, after the usual greetings.

"I guess I can, if it's important, Hil," I replied. "I was planning to stay at home and watch the game between the Yanks and the Giants, but that doesn't matter."

"Never mind about the game, Frank. Set your recorder and you can watch it after you get back. I have a most curious problem to solve and I want your help."

"You mean that you want my company," I laughed. "You know darned well that it's little help you ever get from me."

Hilary's eyes wrinkled into a smile and he rubbed the tip of his hawk nose with the forefinger of his right hand; a little habit he had when he was in any way embarrassed.

"You help me more than you realize, Frank," he said, shaking his head. "I can never think to the best advantage without someone with whom to discuss my thoughts, any more than a pen can write without paper. Will you come?"

"Thanks for the compliment?" I exclaimed, laughing again, "but I should like to remind you that a pen will write very well on a block of wood! Yes, surely I'll come. Be there in fifteen minutes."

He hung up the receiver and his face vanished. I picked up my tunic from the chair where I had thrown it and went upstairs to the hangar in the attic, where I keep my little two-seater. After making sure that I had enough Vrilol for the trip, I opened the roof-panels, stepped on the starter and threw the lifting helices into high.

A few seconds later I was at the commuting level and set my course to the east at a comfortable four hundred miles an hour. Corwin's place was about eighty miles from my bachelor diggings, so I could be there well within the time I had stated. I lit a cigarette and turned my thoughts to the probable object of my trip.

Hilary Corwin was somewhat of a mystery. I had

Star Dust

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A few seconds later I was at the commuting level and set my course to the east at a comfortable four hundred miles an hour. Corwin's place was about eighty miles from my bachelor diggings, so I could be there well within the time I had stated. I lit a cigarette and turned my thoughts to the probable object of my trip.

Hilary Corwin was somewhat of a mystery. I had

known him for a long time. In fact, I think I may say that I was his only intimate friend, if indeed our relationship could be dignified by the name of intimacy. He seemed to regard me somewhat as Sherlock Holmes regarded the redoubtable Dr. Watson, in the light of a mental punching bag or chopping block.

Not that Corwin was a detective. The fact is that in spite of our long acquaintance and alleged intimacy I had no definite knowledge of what he did for a living. That he made a living, and a very good living, too, was obvious, but although he continually enlisted my help in various enterprises for which he received large fees, it would be impossible to assign his work to any particular profession, because no two of his "jobs," as he called them, bore the slightest resemblance to each other.

AS nearly as I can describe it, he had the type of knowledge which begins where that of other men leaves off. It was the breadth and catholicity of his learning which rendered his services so valuable. Had some great engineering contractor encountered a problem which his own experts were unable to solve? Send for Corwin! Was the Attorney General of some European Republic in difficulties over a point of law? Send for M. Hilary Corwin! Did one of the shipping companies want to remodel their aerial transportation lines? By all means send for Dr. Corwin. I have even known the management of a great New York restaurant send for my friend to teach the French chef the correct way to make a savory dish, which was a favorite among Roman epicures in the days of Nero!

There was little doubt, therefore, that whatever problem was occupying Corwin's mind at the present moment, it would be something different from the usual, and, judging from his excitement, something interesting and quite out of the ordinary. My time was my own. I am single by choice and wealthy enough to do what I like. The prospect of sharing in another of Corwin's adventures, even in the humble capacity of mental chopping block, appealed to me strongly.

These thoughts passed through my mind as I sped across the city and into the open country until I dropped on the wide lawn in front of Corwin's house and found myself shaking hands with my friend.

His tall, sinewy figure, piercing black eyes and thin, prominent nose conveyed an impression of vitality and mental alertness, which harmonized with his quick gestures and emphatic speech. He was clad in tunic and breeches of sombre brown, and had evidently been engaged in some scientific work when he heard my plane descending, for he carried an electrical instrument of some kind in his left hand.

"Glad you were able to come, Frank! Have you had lunch? Good. I thought I saw the dishes on the table when I phoned you. Come into the lab and I'll tell you what I'm up against."

He led the way up the sloping gravel path into a large low building which he used for the numerous technical experiments which he was often called upon to perform in the course of his investigations. It was a combination of laboratory, machine shop and observatory.

Astronomy was the hobby in which he found relief from his other occupations. The revolving dome with its telescope, spectroscope, cameras, and other instruments, was small compared with the huge observatories in other places, but was exceptionally complete and perfect in its appointments. He had been able to make some very fine original discoveries, especially in the asteroid belt and in the structure of spiral nebulae, and the name of Hilary Corwin was mentioned respectfully by professional astronomers.

Corwin kicked a chair into place for me and perched himself on a high stool, around the legs of which he twined his own lanky legs.

"This is going to be good!" he chuckled. "One of the most baffling cases I've run across for a long time. You've done me the honor, more than once, to compare me to Sherlock Holmes. Possibly you think that I am a 'Jack of all trades and master of none,' like your detective hero. Well, this time we're going to turn detectives and go on a hunt for desperate criminals."

"I'm a perfect reproduction of Dr. Watson in one respect, Hil," I commented. "I'm a first-class sample of the genus Coward, and have no desire to place my life in jeopardy fighting a gang of thugs!"

Corwin laughed boisterously and, jumping from his stool, began to pace the floor, gesticulating and jerking his head in the manner he always assumed when he was delivering a lecture.

"You've heard about the big shipment of gold the Government is sending to Rhodesia?"

I nodded. Everyone knew of the tremendously rapid strides which the new Central African republic had been making in the last few years as the result of the extensive development of the radium mines there. With almost unlimited credit, the immediate need of the Rhodesian government was coin with which to pay the miners, and the shipment to which Corwin referred was part of a loan which was being made by the United States for that purpose.

"Yesterday, fifty million dollars in gold coin was sent from the Mint to the hangars of the Trans-Atlantic Transportation Company. It was packed in heavy oak chests, padlocked and sealed. The gold was moved in motor lorries, accompanied by armed guards.

"On arrival at the hangars, the chests were transferred to a building especially designed for the storage of valuable shipments and were stacked in the middle of the floor. Four guards were left in charge and the doors were locked from the outside. The special freight plane which was to take the money to Rhodesia was scheduled to leave at eight o'clock this morning.

"The Rhodesian officials who were to accompany the shipment arrived on the scene at seven-thirty and were escorted to the storage building by an under-secretary of the Treasury who had the keys. When they opened the door they found that the gold had disappeared!"

"Disappeared!" I exclaimed. "Do you mean that it had been stolen?"

"Presumably so," answered Corwin, "but that is simply theory, as I have no further information than the bare fact that it had disappeared. Vanished!"

"What other explanation can there be?" I protested.

"That remains to be seen," answered Corwin. "I will admit that I have another theory. As a general rule I object to preconceived ideas, on principle. They generally turn out to be wrong when confronted by cold facts, but in this case the facts seem to be fairly obvious. The gold was there at ten p. m. It wasn't there at eight a. m. The building had not been broken into. The guards were still there. It would seem, therefore, that the burglary theory is untenable, so I have permitted myself to theorize to the extent of doing a little work in the lab this morning."

HE waved his hand to a combination of coils and vacuum tubes which stood on a bench near one of the windows.

How did you hear about this mysterious disappearance?" I asked him.

"The under-secretary of whom I spoke phoned me at about nine o'clock and asked me to come down and look things over. I told him that criminology was one of the few professions of which I claimed no knowledge. He said that there were some features of the case which he thought might interest me, and that the Government would permit me to name my own fee, if I succeeded in restoring the gold and would pay my expenses in any case. So I accepted upon one condition."

"What was that?" I asked.

"That I should be permitted to wait until this afternoon before going down to the hangars and that, in the meantime, nothing was to be disturbed. The secretary—his name is Cogswell—seemed like an intelligent fellow, though rather a wind-bag. He said that he had already done what I suggested, after having sent for food for the guards."

"But why wait until this afternoon?" I demanded. "It seems to me that the sooner you get there the better. You might see clues. Fingerprints or something of that sort."

"I hope to get clues, certainly," snapped Corwin, "but as to seeing them, that is quite another thing. The clues I hope to find will probably be invisible!"

"I fully understand," I smiled, satirically. "You think the gold has been spirited away and you are going to take a supply of ectoplasm to cause it to materialize again!"

"Don't try to be funny, Frank," replied Corwin, calmly. "My theory is simply that the gold has been hidden, either deliberately or accidentally, and I have prepared this apparatus so that I can find it, whether it is in sight or not. Nothing very mysterious about that, is there?"

"No, not at all!" I said, smarting under Corwin's contemptuous remark with reference to my powers of humor. "I have no doubt you will find the fifty million in a crack in the floor. It only weighs about a hundred tons or more! Or possibly it got picked up by the vacuum cleaner!"

"You *are* stimulating to the imagination!" Corwin observed with enthusiasm. "Your comments are so inane that they energize my mental powers by sheer force of contrast! Now, if you have quite finished with the comedy, perhaps you will assist me to pack this stuff into the plane."

In half an hour we arrived at the Trans-Atlantic Hangars where we were met by Cogswell, the Treasury man, and a couple of the Rhodesian officials. Cogswell immediately started to give a long-winded account of the mysterious robbery, as he called it, but Corwin cut him short without ceremony.

"I'll handle this job my own way, if you don't mind, Mr. Cogswell," he snapped. "I take it that the Government is chiefly interested in getting the money back."

"Most certainly we are, Dr. Corwin," exclaimed Cogswell, "and I can assure you——"

"If you can assure me of a clear field for my investigations, I shall be quite satisfied!" interrupted my friend with finality. "Please take us to the storeroom."

The huge hangars, capable of housing a dozen passenger and freight planes, were ranged in a row facing the sea. Behind them in a long, low building with narrow gauge track running beside it, were the main express offices, where goods for shipment to all parts of Europe and Africa were sorted out and distributed to the various hangars.

THE building where the Rhodesian gold had been received stood by itself on the top of a small knoll at some distance from the other buildings. It was of solid stone and the few windows were heavily barred. It had been erected for the safe handling of just such valuable consignments as that for which we were now searching.

Cogswell opened the heavy door and ushered us into the building. As we entered, four men in the bright yellow tunics and breeches of the Treasury Guard rose from the table where they had been enjoying a late lunch, and came forward.

"You will wish to question these men, I presume, Doctor," said Cogswell.

"Possibly," replied Corwin, calmly. "If you will be kind enough to have the two boxes brought from my plane, Mr. Cogswell, I shall not trouble you any further. No doubt you have other business to occupy your time. I will notify you when I have located the gold."

The Secretary looked at Corwin as if he could hardly believe his ears. Evidently he was not accustomed to being dismissed in such a summary manner.

"But, really, Dr. Corwin," he stammered, flushing with anger, "you apparently fail to realize that I am responsible for the safety of this money. It is absolutely necessary that I should be present during your investigations."

"All right, have it your own way," replied Corwin, with undisturbed good humor. "Come along, Frank, we'll be on our way. Sorry to have troubled you about nothing. You'll come back to my place for dinner, I hope."

Cogswell collapsed and retired with as much dignity as he was able to assume. Corwin immediately started to examine the room without paying any further attention to the discomfited official.

The storeroom, which was about thirty feet square, occupied the entire building. There were no partitions and no furniture of any sort except a table and three or four chairs which had been sent in to enable the imprisoned guards to eat their meals in comfort. The floor was an unbroken slab of cement and the walls were uncovered, being simply the inside faces of the stone blocks of which the entire building was constructed. There was no ceiling, the roof being of heavy sheet iron.

In short, there was no place in which one could have concealed a single five dollar gold piece, to say nothing of ten millions of them, besides a hundred heavy oak chests.

Having in mind the methods of Sherlock Holmes and other great detectives in the world of fiction, I looked for my friend to produce a magnifying glass and begin a long hunt for fingerprints, footmarks and other clues, but I was doomed to disappointment. After a very casual inspection of the room, he turned to the four guards.

"I presume that you are in command," he said briskly, addressing one of the four, whose yellow tunic was bordered with blue.

"Yes, sir," answered the sergeant, saluting.

"In that event," said Corwin, seating himself in one of the chairs, "will you kindly state briefly the circumstances surrounding the disappearance of the gold?

Please omit nothing of importance but endeavor to refrain from the unnecessary loquacity which seems to be characteristic of the Treasury officials."

"I will try to do so, sir," answered the sergeant, stiffly, though his eyes twinkled at Corwin's analysis of their superior, and the glee of the other three was obvious.

"We accompanied the shipment from the Mint last night, sir," the guard went on, "arriving here at half past six. After the cases had been counted by Mr. Cogswell and myself, I signed a receipt for them and he left, locking the door on the outside.

"Our orders were not to let the cases out of our sight, although it's hard to see how anything could happen to them in here. However, I decided to take no chances and ordered Blake here to sit on one of the chests. The other two watched the windows and I spent most of the night walking round and round the room.

"Just before daybreak——"

"Time!" snapped Corwin.

"Beg pardon, sir!" said the sergeant, "4:45 a. m. as near as I can tell."

"Go on," ordered Corwin, "and please try to be accurate."

"Well, sir, at about 4:45 a. m. one of the men who was watching the windows called me over to see a funny light in the sky. It was a narrow band, almost like a searchlight, only it didn't spread at all. It was bluish in color and passed directly overhead, running east and west."

"In which direction did it seem to originate?" queried Corwin, leaning forward. I was wondering what possible bearing a light in the sky could have on the stolen gold, but my friend seemed to be intensely interested.

"I can't say, sir," replied the sergeant. "You see, it didn't move or flicker at all but just got brighter and brighter until we could hardly bear to look at it. Blake heard our remarks and came over to see what we were looking at. Just as he got to the window, the light went out and at the same instant there was a most tremendous crash, followed by a rumble."

"A crash!" Corwin exclaimed. "What sort of crash, and where?"

"Right here in the room, sir," replied the sergeant. "It sounded like a lot of heavy boxes rolling down a flight of stairs. The sound got fainter and fainter and then died away altogether. At the first bang we all turned around and saw—well, sir, I don't know as I can explain properly what we saw."

"Do your best, but make it short," said Corwin, encouragingly.

"Well, sir, don't blame me if it sounds crazy, but we saw the cases, only we couldn't see them. They were tumbling all over each other, but they were standing perfectly still. They looked misty, kind of, and for a moment I could see the gold inside quite distinctly. And next thing we knew, they weren't there at all. That's everything, sir."

I WATCHED Corwin during this amazing farrago, expecting every moment that he would cut the sergeant short. Even a child could see that the whole story was a tissue of lies, very unskilfully designed to conceal the real facts. No doubt existed in my mind that the four guards were in collusion with the actual thieves. A duplicate key, a gang of men to carry the chests to a plane, hidden at a distance—why the whole plot was obvious!

But to my surprise, Corwin seemed to be paying the closest attention to the sergeant's wild story, and several times he nodded his head as though in approval, especially at the mention of the beam of light in the sky and at the impossible account of the disappearance of the gold.

"Thank you, Sergeant," he said, when the other had ceased speaking. "Your conciseness and accuracy are most refreshing. Now, Frank, please give me a hand with the apparatus."

The various appliances which Corwin had brought from his laboratory included four large coils of wire, fastened together in pairs, each pair being provided with terminals or binding posts. There was also a pair of receivers of the radio type, an amplifier and the necessary high and low tension batteries for its operation.

Corwin set up the amplifier and connected one of the pairs of coils to it. The other pair were attached to a handle about eight feet long and were also connected to the amplifier by means of a long, flexible cable.

When the connections were complete, Corwin put on the head receiver and began to adjust the rheostats of the amplifier. A puzzled expression passed over his features and he rubbed his finger up and down his long nose thoughtfully. Presently his face cleared and he nodded vigorously.

"Take those exploring coils, Frank," he ordered, pointing to the pair which were provided with a handle. "I want you to carry them backwards and forwards across the room, holding them close to the floor. Cover the whole area in regular bands."

I FOLLOWED his instructions without protest, although I was completely at a loss to understand what he was attempting to do. Corwin made no comment as I carried the coils backwards and forwards until I reached the centre of the floor.

"Ah! Stop there!" he cried, excitedly. "A little to the left. No, not quite so far. Now, just a little this way. There, stop there. Leave the coils lying and come here."

When I donned the receivers, my ears were assailed by a high pitched singing. When Corwin picked up the exploring coils as he called them, and moved them in various directions, I noticed that the sound grew fainter, being loudest at a point near the centre of the room and about three feet above the floor.

"Beg, pardon, sir," remarked the sergeant, who had been watching Corwin's antics with great interest, "that's where the boxes were piled."

"So I judged," replied Corwin, shortly. "They are still here. You were quite correct when you said that they did not appear to move."

"Still here?" questioned the sergeant, gaping.

"Yes, right here in the middle of the room and also a million miles or more away, maybe," answered Corwin calmly, as he turned to dismantle his apparatus.

Familiar with his methods, I knew Corwin too well to bother him with questions. He would explain when he was ready to explain; not a moment before. Although I had gathered nothing from our visit to the store-room save the mere skeleton of a theory, Corwin, I knew, had done much more. The satisfaction on his gaunt face betrayed the fact that he regarded the "job" as practically finished.

"We are going for a little walk," he remarked to the sergeant. "My friend and I have never seen the hangars

and the opportunity is too good to miss. Kindly have these boxes put in my plane. By the way, sergeant, I regret that it will be necessary for you and your men to remain here until this evening to guard the gold. You must not forget that it is still there in the middle of the room, even though you can't see it! Come along, Frank."

And he walked out, leaving the guards open-mouthed.

When we were out of ear-shot, I could contain myself no longer.

"Your acting was admirable, Hil," I burst out. "What a splendid detective you would have made! You deceived those guards completely. Why, when you were pretending to go through some mysterious rigmarole with the amplifier, you even deceived me for a moment."

Corwin stared at me as though I had taken leave of my senses.

"Acting! Deceiving! Rigmarole!" he exclaimed. "I am afraid I don't quite get you."

"You certainly gave the sergeant a Roland for his Oliver," I went on, laughing, "with your jargon about the gold being right there and a million miles away. And then, to make them stay to stand guard over nothing! What a joke!"

"Oh! I see what you mean," replied Corwin, his face clearing. "Yes, very clever of me, wasn't it? Ha-ha! By the way, you don't happen to own any stock in the Vrilol company, do you? That might make a difference."

Now it was my turn to stare. As it happened, I did not own any stock in the great corporation which had the monopoly of Vrilol, the universal fuel for airplane engines, and I had often regretted the fact, but what bearing this had upon the Rhodesian gold, I failed to see.

"Because, if you do, I should advise you to sell," Corwin went on, without waiting for an answer. "Vrilol will soon be as obsolete as gasoline."

"How so?" I asked. "Some new discovery of yours going to replace it?"

"It is quite evident that you do not keep abreast of the times, my dear Frank. Surely you have heard that the Marconi interests have at last perfected Beam Power Transmission. In three months' time passenger planes will draw their power from the ether. In fact the first Beam plane will cross the Atlantic from here to-morrow."

AS we were talking, we approached a large building at some distance from the hangars and about four hundred yards west of the stone store-room. In front of this building was a double row of steel towers, each bearing a highly polished globe or rather ellipsoid of copper.

"The Paris beam station," exclaimed Corwin. "The

In front of the large building was a double row of steel towers, each bearing a highly polished globe or rather ellipsoid of copper. "The Paris beam station," exclaimed Corwin. "The first of its kind."

first of its kind. Want to go up and have a look? I happen to know the engineer in charge."

My friend was greeted with the utmost cordiality by the engineer who was superintending the final adjustments of the great plant. He escorted us around the building, explaining everything with a flood of technicalities, which left me gasping for breath, but which my friend seemed to understand perfectly.

"This is the Generator Room," he explained. "Eight Sawchuk Alternators direct driven by Ralston High Pressure Vrilol Turbines. Those are the Oscillators, the Modulators and the Mixers"—he pointed to a bank of huge vacuum tubes, similar to the tubes in our television amplifiers, but fully twenty feet in height.

"You see, Frank," remarked Corwin, "the Power Beam is only about ten feet wide where it leaves the station and not over fifty feet wide at Paris. It is possible to confine the waves to a narrow path by utilizing the principle of interference or heterodyning, as it is called. Have you given the plant a try-out?" he asked, turning to the engineer.

"We turned on the power for a few minutes this morning and ran a thousand horse motor in Paris successfully, but the main circuit breaker blew out after about three minutes. We've been readjusting it today."

"At what time did the breaker go out?" asked Corwin.

"It would be about a quarter before five, I guess. It was a pretty sight while the test lasted. The ionization of the air particles in the path of the beam lights up the country for a mile or more on each side. The pilots won't have any trouble in keeping their course at night, even without the automatic controls for which we have you to thank, Doctor!"

My growing feeling that Corwin had not suggested visiting the new Beam Station simply to satisfy my curiosity, became a certainty with the Engineer's description of the morning test. This, then, was the strange light which the Treasury guards had seen and which I had put down as a deliberate invention designed to conceal their complicity in the crime.

Corwin, with his scientific knowledge and sense of logic, had instantly jumped at the correct explanation, but why he should have wasted time in checking the accuracy of his theory was quite beyond me. The appearance of the beam of light was an unfortunate accident which served to distract the attention of the guards just at the moment when the robbery took place; nothing more. Surely Corwin did not suppose that the disappearance of the gold at the exact moment when the beam was shut off, was anything but a coincidence. It would almost appear so, yet the idea was so unreasonable, that I could not bring myself to entertain it.

During the short walk to the hangars and the flight back to his house, Corwin did not speak and I refrained from intruding upon the mine of thought in which he buried himself and from which, by past experience, I believed that he would emerge with what he sought.

WHEN we entered the laboratory, Corwin aroused himself from his brown study and clapped me on the back.

"Well, Frank," he cried cheerfully, "another little job finished. What did you think of it?"

"Think of it!" I repeated. "What can I think except that you have failed?"

"Ah! You think so?" he smiled, and walking across to the telephone, dialed a number.

"Mr. Cogswell? Yes, this is Corwin speaking. Will you kindly be at the store-room at ten o'clock to receive the Rhodesian Gold? What's that? No, no. I haven't got it back, because it's still there. Oh! Yes. You might bring four more guards. It will hardly do to ask the same men to take duty for another night."

As he hung the receiver on the hook I could hear Cogswell's voice, shrill with excitement, pouring forth a stream of unanswered questions.

"Now then, Frank," said Corwin, perching himself on his favorite stool, "I take it from your remark about failure that you are not quite clear on some points. Forgive my seeming discourtesy, but you know I never like to talk until I have finished with a job. Now I'm ready to answer any questions you care to ask."

"Well, in the first place, what was the contraption with the amplifier and the coils?" I queried.

"Nothing very mysterious about that, Frank," he replied. "It was simply a Kelvin Balance. One of the tubes in the amplifier is arranged to deliver an oscillating current at audio frequency; that was the shrill whistle you heard. The four coils are inductances connected in such a way that under normal conditions they are balanced with respect to the receivers, in which case no sound can be heard. When the two coils on the handle are brought in proximity with any considerable mass of metal, the balance is disturbed and current flows in the receivers, producing an audible sound which becomes louder as the coils approach the metal.

"I will admit that when we went to the hangars I entertained the idea that the gold had been concealed somewhere in the vicinity; buried under the floor, perhaps. A casual inspection put that theory out of court. Nevertheless, I determined to try the Balance and was somewhat surprised to find that the loud whistle indicated that the gold was still in the centre of the room. Since it was apparent to neither sight nor touch, it was obvious that in some way it had become both invisible and intangible, or, to put it more accurately, that the gold was both there and not there. Perhaps I shall make myself clearer by saying that it was there electrically, but not there to the human senses.

"The sergeant's story confirmed my suspicions. Note that at the instant of the disappearance, the guards received the impression that the oak cases were transparent. They seemed to move and yet seemed to be stationary. Possibly, to you, that sounded like nonsense. To me it was an exact description of what took place. The beam of light across the sky which I recognized immediately as the effect of the new Beam Station furnished the only missing link in the chain of logic."

"But I still don't understand, Hil," I protested, utterly mystified. "You say the gold is still there. If so, why can't we see and feel it."

"Simply because it has fallen through what is vulgarly known as the Fourth Dimension," stated Corwin, calmly.

"Oh, come, Hil!" I cried, laughing. "That's going a bit too far! The Fourth Dimension is all very well as a subject for imaginative fiction, but you can hardly expect to convince me or anyone else that such a thing really exists."

"I was never more serious in my life, Frank," said Corwin.

"But how can you prove the existence of a Fourth Dimension?" I objected.

"The shoe is on the other foot, Frank. How can you

prove that there is no Fourth Dimension, or Fifth or Sixth or Twelfth Dimension for that matter?"

For a moment I was nonplussed and before I could think of a logical answer, Corwin went on.

"Let me ask you a few questions, Frank. How do you know that there are more than two dimensions?"

"Why, by seeing them, of course," I answered. "Take that box over there for example. You can see that it has length, breadth and height. But you can't see that it has—whatever you call distance—in the Fourth Dimension."

"THAT'S where you make a very common mistake, Frank," said Corwin. "I mean in supposing that you can see in three dimensions. If you think for a moment you will realize that you can see in only two dimensions; in the flat, as it were. It is true that for very near objects we have a sense of solidity due to the fact that we have two eyes, which gives us the stereoscopic parallax as I may call it, but everything beyond a certain distance, say a hundred feet, we see practically in the flat and we owe our knowledge of the third dimension, not to the sense of sight, but to another of the senses."

"Do you mean the sense of touch?" I asked, doubtfully, after a moment's thought.

"Certainly!" said Corwin. "Suppose you pick up a cube—a child's building block, for example—in such a manner that your thumb and fingers touch three adjacent sides simultaneously, you are conscious through your sense of touch of three dimensions. Our impression that we *see* in three dimensions is purely an illusion. The sight has to be educated by touch before we can learn to judge distances."

I sat silently, turning over Corwin's arguments in my mind. Seeing that I was not quite satisfied, he picked up a book from the table with an impatient gesture.

"Have you read this?" he asked abruptly.

"What is it?" I returned.

"Can't you read?" he demanded.

"Of course I can, but you're holding the wrong face of the book towards me." I said.

"What difference does that make?" he asked, with a quizzical twinkle in his eyes. "If you can see in three dimensions, as you contend, you should be able to see all sides of the book at once."

"I give in!" I exclaimed, laughing. "But I don't quite understand what you are driving at."

"Simply this, Frank," he said. "That you must not expect to be conscious of the Fourth Dimension through the sense of sight, since you cannot see even in three dimensions. If we ever come to know anything about the Fourth Dimension at all, it will be through the sense of touch."

"But we can't feel in four dimensions, can we?" I demanded.

"No, you are right," replied Corwin. "We cannot feel in four dimensions for the simple reason that there is *nothing to feel*. As far as we know, solid objects have no extension in the Fourth Dimension. Imagine a man who had spent all his life on a flat desert, extending in all directions to the horizon. Never having had any training in more than two dimensions, it is conceivable that if he were suddenly brought face to face with a mountain, he would not know what he was looking at. It would be meaningless to him. He could not *grasp* it any more than we can grasp the possibility of a four dimensional object."

"But you say that there is nothing in the Fourth Dimension," I said. "How can you know that?"

"By a simple analogy," Corwin answered. "Take the case of our imaginary desert dweller. If a mountain were suddenly dumped down in the middle of his desert, he could not *see* it, because he would not have the necessary training to see in three dimensions, but he would certainly be *aware* of it, because he would find an impassable barrier blocking his way to an area, which he was formerly able to reach without difficulty. Similarly, if four-dimensional objects existed in our part of space, we should constantly find ourselves confronted by invisible and yet impassable barriers."

"YOUR arguments are difficult to contradict," I admitted, "but all this is theory and I cannot see what practical application the theories have to the present case."

"Look here!" explained Corwin, jumping up and running over to a blackboard, where he made a rapid sketch.

Fig. 1.

"These are supposed to be four bars," he explained, pivoted at the ends and having the centres joined by rubber bands. The thick lines are the bars and the thin lines represent the rubber bands. You must try to imagine that the bars have no thickness and that the bands simply represent forces which are tending to pull the centres of the bars towards one another. In other words, the whole thing has one dimension only—length. The bars would remain in the position shown, because the pull of the bands is lengthways, in which direction the bars are rigid.

"Now suppose that we tilt one of the bars ever so slightly out of line with the others, what will happen?"

"The bars will be drawn into a square by the rubber bands," I replied.

"Exactly! Like this," and he made a drawing.

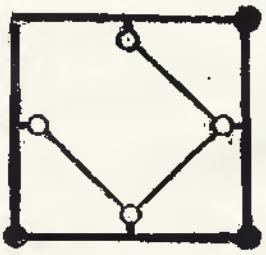


Fig. 2.

"You see," he went on, "we have taken *four* one-dimensional objects—lines—applied a tractive force, given them a slight tilt in the Second Dimension and produced a *two*-dimensional outline—a square.

"Now take a step further. Here are six squares, their centres joined by rubber bands as before—

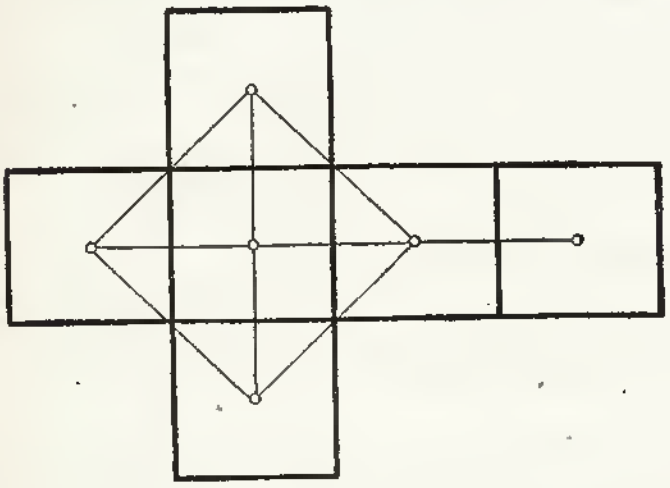


Fig. 3.

"They are in a state of equilibrium until you tilt one of them ever so little out of the plane of the others. What will happen?"

"They will form a cube!" I answered.

"Precisely!" assented Corwin, "and it will look like this," and he drew another outline.

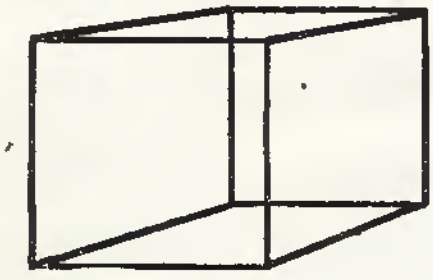


Fig. 4.

"We have taken *six* two-dimensional objects—squares—applied a tractive force as before, given them a slight tilt in the Third Dimension and presto! We have a *three*-dimensional outline—a cube.

"Note, Frank, that *objects* in each dimension form the *boundaries* of objects in the next higher dimension. Thus we can make a little table like this:" and he wrote on the board:

Two Points (no dimension) bound a Line (one dimension)

Four Lines (one dimension) bound a Square (two dimensions)

Six Squares (two dimensions) bound a Cube (three dimensions)

Eight Cubes (three dimensions) bound a Tesseract (four dimensions)

"Here are the eight cubes."

With surprising facility, he produced the following drawing on the board:

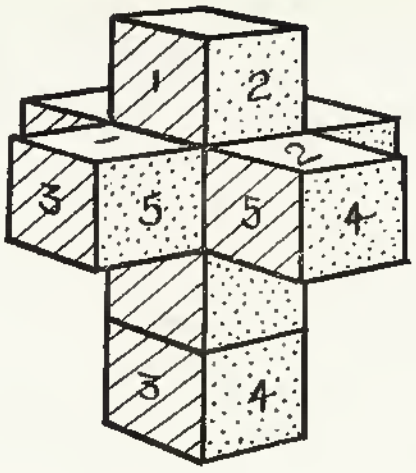


Fig. 5.

"The centres of the cubes are supposed to be attracted by forces," Corwin explained. "We cannot use rubber bands as before, because the cubes are solid, therefore we must imagine some force like magnetic attraction. The cubes will remain immovable, that is to say in stable equilibrium, unless we give one of them a slight tilt out of line with the others *in the Fourth Dimension*. Then they will be drawn into the form of a Tesseract, as a four-dimensional object is called. The faces which bear similar figures will come into contact; number 1 with number 1, and so on."

"But what would it *look* like?" I asked, somewhat staggered by Corwin's unanswerable demonstration.

"If we could see it at all," he replied, "it would look something like this:" and he produced another sketch.

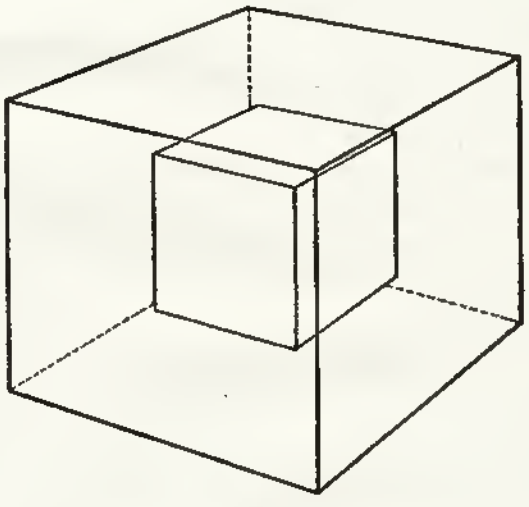


Fig. 6.

"Well, but that simply represents a small cube inside a large one. The original cubes were all the same size."

"That is an illusion of perspective," Corwin explained. "The cube appears smaller because it is further away from you in the Fourth Dimension, just exactly as the square which forms the distant side of a cube appears smaller than the square which forms the nearer side. Measure the front and back faces of the cube in Figure 4 and you will see what I mean."

I looked at Corwin's last drawing thoughtfully, tilting my head first one way and then the other.

"I'm sorry, Hilary," I said at length. "I have heard your explanations. I'll even go so far as to say that I understand them. But, somehow, I can't seem to grasp that Tesseract of yours. Whatever way I look, it's just a little cube inside a big cube."

"Of course you can't grasp it!" replied Corwin, smiling. "Neither can an Australian Bushman 'grasp' a photograph. It's a matter of visual education."

I TURNED away from the tantalizing sketch with a sigh of resignation. The longer I looked at it the more I felt that I was just on the point of seeing something, only to have it snatched away.

"All right, Hil, I'll take your word for it," I said. Now tell me how all this applies to the gold."

"I have explained the Fourth Dimension at some length, Frank, to show you that there is nothing so very mysterious about it. Picture those oak cases of gold coins piled one on top of another. Enormously heavy. Acted upon by we can't say what forces, gravitational or electrical *in the Fourth Dimension.* All they needed was that tiny *tilt* out of line to cause them to fall a short distance in that Fourth Dimension. The distance they fell would not need to be very great for the chests and their contents to pass entirely beyond our ken."

"You speak of a slight tilt in the Fourth Dimension, Hil," I commented, "but what could possibly give the cases of gold any such tilt?"

"Pooh! Where's your imagination, man?" cried Corwin. "What else could it be but the new Power Beam or rather the shutting off of the Power Beam when the circuit breaker blew. I have ascertained that the plane of the beam exactly intersects the centre of the store-room. I have long held the theory that magnetic lines of force are actually the result of a strain in the ether acting in the Fourth Dimension. Some day I intend to publish an article on the subject."

"I can understand that the Power Beam must produce a tremendous strain in the ether," I said, but why did not the gold fall into the Fourth Dimension when the Beam was first turned on?"

"Here, let me illustrate!" exclaimed Corwin, snatching up a rubber band from his desk. "Catch hold of one end of this band, which represents the ether. You understand that they start the Power Beam gradually by means of rheostats. I will represent the condition of the ether by stretching the rubber band slowly. Now I hold it fully stretched. This is the condition with the Beam working at full strength."

Suddenly he released his end of the band, which recoiled violently, cutting me sharply across the knuckles.

"Ouch!" I cried, withdrawing my hand with an involuntary jerk.

"Precisely! Ouch!" mimicked my friend. "That represents the sudden shutting off of the Beam. Is the demonstration clear?"

I agreed that it was and, the lecture being complete, we adjoined to Corwin's house for dinner.

AT a quarter to ten that night, Hilary Corwin and I alighted once more at the flying fields where we found Cogswell, the Treasury Official, awaiting us. It was apparent immediately that Cogswell was in a very bad temper, but a glance from Corwin was sufficient to remind him that he was likely to get the worst of a verbal encounter with the scientist.

We walked up to the store-room which was dimly lit by means of two hand-lanterns, the electric lights having gone out of commission at the same time that the gold disappeared.

"Now, Mr. Cogswell," said Corwin, "I promised to notify you when I had found the gold. This I have done and at ten o'clock precisely, I hope to demonstrate the correctness of my theory."

"Is it permissible for a mere Government official to ask what that theory is?" queried Cogswell, satirically.

"Certainly it is permissible," replied Corwin, blandly, "but no answer will be vouchsafed! I should like to point out that your duties are restricted to receiving the gold from me. My duty is to find the gold and return it to you. I suggest that we shall do well to abstain from interfering with each other in the performance of our respective duties."

For a few seconds I thought that poor Cogswell would burst a blood vessel, but Corwin completely ignored the furious official and continued in a quiet voice:

"It is two minutes to ten, gentlemen. Please take your places along the north and south walls of the room. I would not be responsible for the safety of any person in the centre of the room at ten o'clock. As my friend here has reminded me, the Rhodesian gold weighs very many tons! Forty seconds more. At ten o'clock, Frank, the Power Beam will be turned on full strength. The sudden strain on the ether thus produced will, I hope, reverse the action of the previous strain and, presto—Ah! Here comes the gold, Mr. Cogswell."

The room was lit by a glare of bluish white light, so intense that involuntarily I clapped my hand over my eyes. Then I heard a faint rumbling sound, seeming to come from an immense distance.

I withdrew my hand and looked towards the centre of the floor. There, hovering in the air, was a tiny opaque spot which rapidly grew larger. In a few seconds it was as large as an orange.

"Holy Moses! It's the gold!" shouted the Sergeant.

There it was, a hundred massive oak cases hanging in the air and occupying a space not larger than an orange! It was like looking at them through the wrong end of a telescope. Suddenly it flashed across me that the cases looked small because we were viewing them from a great distance; a distance measured in the Fourth Dimension.

Larger and larger grew the cases, louder and louder became the rumbling sound. Then there was a last tremendous bump, a dense cloud of choking dust filled the room and—silence.

"The Rhodesian Gold, Mr. Cogswell," said Corwin, calmly.

It would be hopeless for me to attempt to describe the excitement of the four guards, the Secretary and myself over this dramatic culmination. The great oak chests were there, piled in the centre of the floor as neatly as they had been twenty-four hours sooner. Only one thing was changed. The outside of the cases was thickly coated with a fine, crystalline dust, a dust which gleamed and scintillated with every color of the spectrum, as though it were crushed opals.

At the sight of this strange dust, Corwin displayed his first sign of interest. He had whipped out a pocket magnifying glass and was examining the surface of the chests, when Cogswell interrupted him.

"My dear Dr. Corwin!" he began pompously, expanding his chest like a pouter pigeon. "I wish to con-

vey to you the hearty thanks of the Government for the remarkably efficient way in which you have conducted this investigation. You will not find the Government lacking in appreciation—.

This was as far as Corwin allowed him to get in his speech.

"All right, all right, Mr. Cogswell!" he exclaimed with an impatient gesture. "I can dispense with the rhetoric. The Government may show its appreciation by sending me a cheque for fifty thousand dollars tomorrow."

"F-f-fifty thousand!" stammered Cogswell, "Well, really, Dr. Corwin—"

"Oh! Of course, if you don't think one tenth of one per cent is a large enough commission, by all means make it more! Frank, would you kindly get me one of those instrument cases out of the plane. I wish to take this dust to the laboratory for analysis."

THIS is really the end of the story, which Hilary Corwin has permitted me to make public, but there was a sequel which, if possible, was more amazing than anything else connected with this strange case.

When we returned to Corwin's house, he hurried me into the laboratory to help him with an investigation of the glittering powder.

"We'll try the spectroscope first, Frank?" he said. "As you probably know, that is an instrument for analyzing light. I shall heat a sample of the powder to incandescence and allow the light from the vapor to pass through this prism. Each substance emits its own characteristic light. Very often the spectroscope is the quickest and most accurate means of determining the composition of an unknown substance."

While he talked he prepared and focused the instrument, arranged a spirit lamp in front of the slit and put a minute portion of the dust on a platinum wire. This he inserted in the colorless flame, which immediately flared into brilliant purple.

Corwin applied his eye to the eye-piece. Next moment he was dancing round the room like a madman.

"The double in Andromeda!" he shouted. "More than forty thousand light-years! The double in Andromeda! Look for yourself!" and he seized my arm and dragged me to the instrument."

I looked into the eye-piece and saw five vertical lines of light, spaced at irregular intervals against a wall of darkness. Two of the lines were deep blue, one emerald green and two were crimson.

"But what is it? What does it mean?" I asked wonderingly.

By this time Corwin had calmed down to some extent.

"It means, Frank, that I have discovered the only missing element," he said. "This box of dust is the only known sample on earth and it will probably remain the only known sample. It shall be called Corwinium. I knew that this substance existed, but I little thought that I should ever isolate it."

"But if you have never seen it before, how did you know that it existed?" I asked, almost as excited as he had been.

"You know the history of Helium—but come, I will show you!" and he led the way to his observatory.

At the pressure of a button, a slit in the dome swung open and the dome revolved until the telescope pointed to the western sky. Corwin spent some moments adjusting the great tube and then motioned for me to take his place at the eye-piece.

In a velvet sky, spangled with points of light, I saw two stars, very close together and purple in hue.

"That is the famous double star in Andromeda," Corwin explained. "It is situated at a distance of forty thousand light-years from the earth, or about two hundred and thirty-five thousand million million miles. You know that astronomers use the "Light-Year" as a unit of distance, that being the distance light travels in a year. Now we will try the spectroscope."

Rapidly he attached an elaborate instrument to the eye-piece of the telescope.

"By means of the spectroscope, we are enabled to analyse the composition of the stars, precisely as we can analyse substances in the laboratory. Now look!"

Again I peered into the glass; but this time, instead of the twin stars I saw ten vertical lines of light. Four were deep blue, two emerald green and four were crimson. They were identical in color and spacing with those produced by the crystalline powder, save that each line was double.

As I looked up at Corwin, my face must have been a study in bewilderment.

"Don't you see what that means, Frank?" he said. "Our new element, Corwinium, has never been discovered on earth. Its spectrum has never been seen, save in the light of that double star in Andromeda. So far as we know, Corwinium does not exist anywhere in the universe, save in those twin stars. That dust on the gold chests is star dust; dust from countless billions of miles away."

By this time I was ready to believe anything Hilary Corwin told me. Besides, in this case, the evidence for his otherwise incredible statement was before my eyes. It did not admit of contradiction.

"But, Hil," I said, a little breathlessly, "how could dust come from a star all that distance away?"

"In the first place, Frank," he said "that dust did not come from the twin stars themselves. They are suns like our own and inconceivably hot. It came from one of the planets revolving around the double star. That planet may be, in fact is, forty thousand light-years away in *three dimensions*. But due to the curvature of space, it is touching our own earth *in the Fourth Dimension*.

"When the Power Beam was turned on this evening, the chests of gold came back. They came back across the cosmic universe, bringing with them the dust of infinite space—the star dust of the double star in Andromeda!"

THE END

The Red Peril

By Capt. S. P. Meek, U. S. A.

(*Continued from page* 503)

against the unprotected sides of the doomed Russian and tore great holes in the fabric even as the stricken ship plunged into the waves of the Atlantic. The transport swung its projector tube in the direction of the three remaining Soviet craft.

"Keep up the fire!" cried the Marshal.

A rain of radite shells was poured into the doomed craft. As the tube pointed in its direction and Hamilton's generators came into coincidence with the Russian's, the hum momentarily ceased and the shells took effect. Another of the invaders crashed, a flaming ruin, into the sea. The other two turned to fly, but they were too late. First one and then the other was covered by the projector connected with Hamilton's generator and, riddled with radite shells, took the last long plunge into oblivion. Van Hornung spoke again through his communicator.

"All ships in formation," he directed. "Scouts go ahead and bombers follow the flagship. We have eliminated the only Russian craft that we need fear and we are about to invade Russia and dictate peace terms to Leningrad."

* * * * * * *

"WHAT is that island, Boris?" asked Isabel Vestoff as she looked languidly through the windows of a luxurious cruising aerostat at the waters of the South Atlantic.

"That is St. Helena," he answered as he glanced at the map before him.

"Oh, it is? Isn't that where the Russian leaders are exiled?" she asked.

"Yes. They are exiled there with a field force from Nashky's generators surrounding the island. No ship can land there except on the one day a month when the generators are silent for an hour to allow supplies to be landed."

"I think it is wonderful that Field Marshal Van Hornung should have been able to subdue Russia with hardly any loss of life."

"It was only because the Russian people were tired of being ground into the dirt by the Council of Seven and the Commissars. As soon as they found out that the power of the Soviet rulers was broken, they looked on the Allied fleet as their deliverers and all they asked was that a commission be appointed to govern the country until they had learned to govern themselves enough to be admitted to the Confederate States of Europe. Van Hornung is a great man."

"Not as great as you and General Hamilton, Boris."

"I'll admit that you are right as far as Hamilton is concerned. But for his generators, my work would have been useless. I might have checked the pneumonia, but they would have showered the world with some other worse disease that we could not have checked. I couldn't have got into Russia again."

"Yes, that is true, but all the same, except for you, countless millions would have died of pneumonia, I among them."

"Yes, our work fitted in nicely. I was just in the nick of time to save you. Another two hours and I would have been too late. But while you're talking about heroes, don't forget to mention my sister. She was the nerviest one of the bunch."

"She was a real heroine and there is nothing that the world wouldn't give her, but I never could understand why she gave up everything to marry Balinsky and live in exile with him. What do you suppose they will do with him?"

"Ilga says that since Von Helmer operated and removed a bloodclot from his brain that he is perfectly sane and is spending his life in repenting for the evil he has done, and in working on new serums to cure the few diseases which we have not conquered. If he continues at that work for a few years, I expect that he will be allowed to leave St. Helena and spend the balance of his life in the comfort to which his genius and good deeds entitle him."

"What will be done with the rest?"

"Nothing, I think. They will be left in exile and in time they will die. With their passing, the world will be forever freed from the menace of the Red Peril."

THE END

The Triumph of the Machines

I had a vision of a far-off age:
Steel-bosomed saurians, in a snorting band,
Went rumbling, flashing through a flame-red land,
And wide, green valleys blackened at their rage.
Meadow and stream were but a blood-marked stage
Where lightning plunged, and fiery whirlwinds fanned
Huge clanking reptiles, gray and iron-manned,
Which prowled like dragons from earth's primal page.

"Are these the dinosaurs of some dead past?"
I murmured; and a mournful voice replied:
"Monsters still unbegotten, which shall cast
Flame and destruction over field and tide,
When man, their maker, in world-shaking pride,
Shall bring the Age of Lizards back at last!"

STANTON A. COBLENTZ

The Coral Experiment

By Alexander Snyder

WE can depend upon Mr. Snyder for a new idea every time. And here he introduces a dentist, who is not only somewhat of a scientist and knows coral well and intimately, but he is also a humanitarian and therefore feels with his patients. Anybody who has ever had a tooth filled knows how grateful we should be for the successful termination of such an experiment as is depicted in this story. It is not at all unlikely that the idea expounded by our author will take root somewhere for the good of all of us who have to place ourselves in the dentist's hands.

WIMBLE was a sad-faced, quiet little man in the late thirties, so colorless as to appearance and personality that he blended with any public background almost to the point of invisibility.

Without in the least intending to be rude, you'd crowd him off the curb in passing, elbow him aside in the subway during rush hours, or step into line in front of him at ticket windows because of his very negativeness.

Privately, however, Wimble made strong men falter, women shrink, and children tremble when they met him for the first time. After that introduction, they didn't dread him so much, because, surprisingly, Wimble so infused them with his unsuspected courage and cheeriness that they forgot to be afraid.

Wimble was a dentist, be frankly advised at the outset, because you may not want to read further when you know that fact. The less you know about dentists, you may say, the better pleased you'll be.

But Wimble has something so wonderful for you and for me and for everybody with teeth, that you're bound to listen when you learn that his great secret is in peril of being lost forever.

You see, Wimble practiced for fifteen years in an immaculate little coop of an office, gently greeting timid patients, bolstering them up with a word here, a soothing smile there; working with so light and deft a touch, doing it so cleverly and honestly, that in spite of his being a dentist, when he finished with his patients, they were his friends.

They'd say to him on parting, "You're all right, Doctor. I'm not afraid of you any more. But that drilling! Can't you fill teeth without drilling?"

"It can't be done," he'd answer decisively. "Not if you want honest work."

Year in and year out Wimble drew on his reserves of nervous energy in order to soothe his patients, and the strain began to tell on him. He still remained inherently cheerful in his office; but after hours, the corners of his mouth drew down still further, and he wore a puzzled, preoccupied expression.

Instead of using his free hours for exercise in the fresh air, and for recreation, he secreted himself in the library of his comfortable bachelor quarters, and pored over text-books pertaining to his profession until the wee sma' hours. Thence to bed and restless sleep, and on to the next day's work, unrefreshed in mind and body.

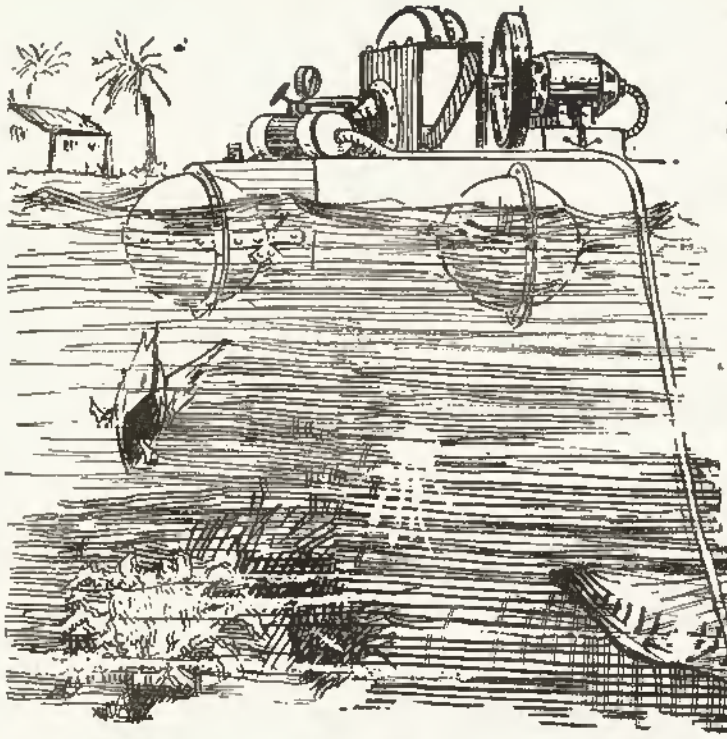
Nature slaps people who flout her that way, and Wimble was no exception to the rule.

He became an object of solicitude to his physician and two specialists, and when they had finished with him, he meekly agreed to put a substitute in his place and take a sea trip for several months, with the alternative of a complete nervous breakdown as the price of disobedience.

He could well afford a vacation, being possessed of a goodly bank account derived from his practice and numerous fortunate real estate speculations, and he sailed with the best intentions in the world of following the doctor's injunction to, "Forget your office and practice completely. Go out and relax and enjoy yourself. For Heaven's sake, man, don't you know how to play? Can't you fall in love or something?"

Wimble wouldn't fall in love and didn't want to. He could and would play, thoroughly enjoying the deck sports. But now and again when his ship touched at some port and unloaded cargo, the rattle and rumble of the steam winches vaguely reminded him of the drilling engine in the office back home, and the parting words of his old patients, "You're all right, Doctor; but that drilling!"

With an effort, he'd forcibly eject such thoughts and take a turn or two about the deck. On the whole he did very well, acquiring a healthy tan, putting on weight, and walking with a real sea-going swagger.



One day the steamer anchored in the little harbor of St. George's, Grenada, in the British West Indies, and a crowd of naked pickaninnies swam out to the ship and dived for coins flung overboard by amused passengers.

Wimble fished into his pocket, abstracted a shiny sixpence, and flipped it into the water. He watched it catch and throw back the rays of the sun as it zigzagged erratically down through the clear depths, until a blurred figure scooped it up in a triumphant hand, almost at the bottom. He turned to the purser who stood next him at the rail, and said in astonishment: "The bottom must be thirty feet down! Yet you can see it clearly!"

"Yep," said the purser laconically, "Bottom's white coral."

ALADDIN rubbing his lamp for the first time could have received no greater shock on seeing the genie appear than did Wimble at the purser's ordinary remark.

One second he was Tourist Wimble, convalescing dentist, bound home to resume the routine he had been accustomed to for fifteen years, and the next he was a man with a purpose so important to his peace of mind, that he decided instantly to renounce his familiar world of comfort and safety, and devote his life to the fulfilment of this purpose, though he should pursue the quest to the ends of the earth.

From that time on until the ship docked in New York two weeks later he restrained his impatience with such an effort that he almost crackled like an overcharged Leyden jar.

Illustrated by
WALLIT

A month of hardy existence metamorphosed him into a brown merman, who spent as much time under water as above it, by means of a simple tube and float arrangement which enabled him to remain submerged for an hour at a time.

He sold his practice immediately to his substitute, an eager buyer, and converted his holdings into cash.

He haunted the Hydrographic Office for days, pored over charts of the Pacific Ocean, inhabited the Public Library until closing time, and made the acquaintance of sundry mariners in the rooms of the Masters', Mates', and Pilots' Association.

Following this period of feverish activity, he shipped numerous heavy crates and cases to San Francisco, going out to the Coast after them. There he gathered his stuff together and took passage aboard a small cargo steamer (on the articles as purser, salary: one cent a month), and found himself in Melbourne some weeks later. He changed again at the latter port for a smaller and still dirtier tramp headed for Papeete.

Here he chartered a schooner, manned by Kanakas and captained by a hard drinking individual known in those waters as "Squareface" Burnell. Burnell's drinking capabilities interested Wimble less than the fact that the man was a walking compendium of knowledge pertaining to lesser known and uncharted islands of the South Pacific.

Wimble stocked up on provisions enough to last him a year, and banked the rest of his money per draft, in Papeete, where he left a letter of instructions for Captain Burnell, to be called for a year later.

Now he cleared away for ports unknown. As each speck of land came up over the horizon, Wimble was all aquiver in the hope that it might prove to be what he was searching for; but one by one the little islands were pronounced as unsatisfactory for his purpose.

All of them were covered with vegetation, and Wimble wanted a new island. He wanted it so new, in fact, that he could watch it grow to completion.

Captain Burnell could well afford to humor his supposedly eccentric passenger, for Wimble had paid him generously, and at last, more through accident than anything else, he raised a perfect atoll, which, he swore truthfully, was not on the charts.

"Now," said Wimble, "put me ashore with my freight and provisions. Build me a shack and a lean-to with a canvas awning, and go away for a year. You'll find instructions waiting for you at the bank, and an expense allowance which will be turned over to you eleven months from date, as per this written order. Remember, I'm counting on you to come back for me. There may be a bonus in it for you."

Grasping as Burnell was, he had the decency to warn the little man of the prospects, nay, the certainty, of hardships on that treeless island. Tidal waves might sweep it, he declared, or earthquakes engulf it. The sun was hot, the rains infrequent though heavy, in that corner of the world, making the problem of drinking water uncertain.

To all of which Wimble turned a listening ear and paraphrasing an ancient nursery ballad murmured,

"But when it is wet, it is very, very wet;
And when it is dry, it is torrid."

After which Burnell sailed away, shaking his head in grudging admiration of the other's magnificent foolhardiness.

But Wimble was nobody's fool. Before the departure of the schooner, the Kanakas had unwrapped the burlap sacking from three Traveler's Palms which formed part of the schooner's deck cargo, and set them up next the shack. The roots were laid in trenches gouged out of the coral, and tamped with fresh earth, also brought along for the purpose. Then a windbreak barrier of coral fragments was erected to the weather side of shack and trees, which stood on the rim of the atoll at its widest point. At high tide Wimble would be twenty feet above water; at low, thirty-two feet.

There was a raft, too, in the lagoon, where Wimble had ordered it placed, and a fox terrier for companionship.

The pile of provisions lay secure under a great tarpaulin, and Wimble had tackle and a rifle for augmenting this stuff with sea food and possible water fowl that might come his way.

NOW that he had achieved his destination, he lay inert for a day, planning the layout of his apparatus, writing out a schedule of daily activities, apportioning his food supplies and even his reading matter, so that he need not worry about running out of either during his stay. He had four huge hogsheads of fresh water for slacking his thirst and for the radiator of his gas engine with which he expected occasionally to charge the bank of storage batteries he had brought along. There was also a supply of distilled water for the batteries themselves. By limiting himself to the minimum of drinking water, and quenching his thirst on canned tomatoes, he'd be enabled to give the transplanted palms a couple of months' rest in their new environment before tapping them for water, should he need it. He had plenty of naphtha for the engine.

On the next day following, he set to work opening the crates and neatly piling the wood behind the shack so that he might build a small addition to house his glass tanks and bulkier apparatus, including batteries and engine. The microscope and chemical supplies he kept carefully covered up in the shack.

Now and again he spoke to "Skipper," the terrier, who had quickly attached himself to his master, and throwing a short piece of wood into the lagoon, would command the dog to retrieve it. He always stood with rifle ready for any triangular fin that might cleave the waters in pursuit of the dog. But there were no sharks in the lagoon, although occasionally they were visible on the sea side.

Wimble was elated at the discovery, and pegged down a rope ladder to enable him to enter or leave the lagoon waters with facility. There were just twenty rungs above water at high tide, and thirty-two exposed at low tide. Being a methodical man, he noted this detail. He supposed the island could not be as desirable for his purpose as one just awash; certainly there could be no crustacean deposits to add to its height above sea level. Below the water line, however, he found large masses of living coral.

It would be interesting, but it is scarcely necessary, to detail Wimble's activities in settling to work during the ensuing weeks. A month of hardy existence metamorphosed him into a brown merman, who spent as much time under water as above it, by means of a simple tube and float arrangement which enabled him to remain submerged for an hour at a time. He simply placed the bifurcated end of the rubber tubing in his nostrils and breathed out through his mouth. Watertight glasses saved his eyes from brine irritation; and at first, until he became hardened, he greased his body with lard to minimize the skin-bloating action of the water.

Soon he had a choice collection of small marine specimens in the tanks behind his shack, and had affixed

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other tanks to the inner wall of the lagoon beneath the surface. This wall was sheer; the seaward side shelving for a short distance.

Naturally Wimble had devoured all the available knowledge of the different specimens of coral to be found in that part of the world, and fascinating as he found the various types, he was forced to confine himself to a limited group of the stony variety. It saved him much research work to know the habits of the coral polyp, and it was his intention to control coral growth, speeding it up under adverse and difficult conditions. He knew that sometimes its deposition occurred at the rate of one, two or three inches a year. Hence his storage batteries, his electrical apparatus for applying a stimulus; hence the chemicals for creating artificial hindrances for the polyps to overcome.

Atmospheric disturbances of minor intensity occurred to vary the sameness of the days. Occasional storms flung spray high over the island; but the shack was waterproofed with painted tarpaulin. The protected waters of the lagoon remained undisturbed. Captain Burnell had worked out a tide table for that latitude and longitude, and Wimble, checking it up, found it fairly accurate.

HE early isolated and stained several polyps in the tanks beneath the lagoon waters, and these had affixed themselves to bits of shell, and begun to proliferate. Soon the stained pink dot that formed the nucleus of the colony would be calcified and covered over with lighter masses of its own kind, until a pea-shaped growth resulted, white on the outside. On exposing this to the air to dry and harden it sufficiently, Wimble would crack it open, and check the time required for formation of the mass. With infinite patience and endless experimentation with the specimens in the tanks behind the shack, he succeeded in obtaining a beautifully concentric forced growth of the *mycedenae* in a few hours.

Into the lagoon countless times; out again. Wimble automatically counted his hand and foot holds, much as a man who, unconsciously listening to a clock strike, will suddenly chime in with his guess and find his guess correct. So Wimble, thoughtlessly climbing up the ladder at high tide, and starting from the surface, would end by saying, "Nineteen, twenty, correct."

One day he caught himself saying, "Eighteen, nineteen, correct."

But it wasn't correct, and it stuck in Wimble's subconsciousness, rattled around inside, and finally gained undivided attention for itself.

Either the tide was unusually high, or—and Wimble was slightly disturbed at the thought—the island was steadily sinking. One foot in a month and a half! It began to look quite serious.

After that Wimble measured carefully, and found a slow and progressive sinking at a regular rate of speed. It didn't worry him particularly, as he felt there would be a safe margin left by the time Burnell should return for him.

He merely made minor changes in his plans, shifting his underwater tanks, and lengthening his work hours, and went right on with his experiments. Next, having forced the growth of coral polyps, and bred them under adverse and hindering conditions, Wimble brought forth a jar of extracted teeth carefully preserved in normal salt solution, and *began to fill cavities with coral!*

As the days, weeks, months fled by, he made such progress, that under proper conditions of temperature, salt water supply, and electric stimulus, he could fill a fairly large cavity in an extracted tooth in less than

an hour. It was curious to watch the decay crumble under the attacks of the voracious polyps, to watch them gain attachment to a sound part, multiply, die, and leave their stony framework mounting higher and higher until the tooth had regained its normal contour. Then the process would be stopped by removal of the favorable stimulus, and by desiccation, and a little gentle polishing would be all the work necessary to complete the filling.

All this without drilling! Ah, that drilling! How often Wimble dreamt himself back in his office, drawing on his nervous energy in order to encourage some patient to put up with it.

Here he had almost perfected a process that would nullify the main terror of the dental office. And after all, there was nothing so very revolutionary in the idea.

Physicians had used live leeches in certain conditions from time immemorial. Yeast, a living plant, was used medicinally. Phagocytes had been set to work fighting germs in contagious diseases. Pearls themselves could be created artificially by irritating certain species of oyster.

NOW Wimble had reached the stage where the idea was feasible, at least under laboratory conditions. He even went so far as to match the various yellows, and grays, found as the principal hues of the teeth. This he did by means of innocuous stains in the brine medium.

He had succeeded far beyond his expectations, and begun to look forward to returning to civilization, where, with refinements of apparatus, and under ideal clinical conditions, he felt prepared to undertake the concluding step in perfecting the process, when the island misbehaved.

It happened at night: a series of slight tremors startling him from sleep. There was a peculiar grating noise, as of friable substances rubbing together, and a small tidal wave followed, coming almost to the level of the shack floor.

Daylight found Wimble eagerly scanning the rim of the atoll. He saw at once there was a break in the periphery.

He waited until extreme low tide, and measuring again at the following flood, found that the subterranean disturbance had also caused the annular island to sink two feet overnight.

This was a serious discovery for Wimble. The regular, slow descent into the sea had not alarmed him, because he figured sufficient leeway to escape before the total submergence of the island; but the seismic disturbance might be repeated with even more disastrous consequences.

Also he discovered that sharks had come into the lagoon, to his grief. Skipper had played at retrieving once too often. There had been a thrashing and flurry in the water, and a spreading crimson cloud to mark the site of the struggle.

Wimble's rifle, long since laid aside in his romps with the dog, spat too late.

Wimble now passed his time carefully tabulating the fruits of his research, binding his notes in oilskin wrappings, and sealing them into a large, glass jar for preservation.

He watched the descent of the island intently, as the end of his voluntary exile drew nearer, and two further disturbances had greatly diminished the margin of safety. Occasional high waves swept the shack, inundating the floor, and ruining part of the apparatus; but Wimble was unmoved by its destruction. He had accomplished practically all that he had set out to do, and the rest would be watching for Burnell's return.

The schooner was due any day now. Wimble had broken down the lean-to at the rear of the shack, and stacked the kindlings in a pile which he could instantly convert to a beacon, should it become necessary. In all the months of his stay, he had spent little time looking seaward for signs of sail or smoke; but now he did.

An afternoon one week after Burnell was due, Wimble lay sleeping before his shack. The sailcloth awning stretched overhead kept the direct glare of the tropic sun off the sleeping man. Late in the day the flaming orb plunged swiftly to extinction in the sea, at the rim of the world beyond the horizon. Its slanting rays, still potent, stole under the edge of the shelter, and across the face of the sleeper.

He stirred, and slowly sat up; but for a space of many seconds he kept his eyes closed tightly, apparently reluctant to relinquish his hold on a friendly dream world for one more tangible and perilous.

He rose heavily to his feet, stretching and yawning, and went about preparing his simple meal. After, and just before dusk, he peered seaward again, frowned, shrugged his shoulders, and snapped his fingers in vexation. For the short twilight period, he sat immobile, in front of the shack.

Suddenly he sprang to his feet and stood intent on a pinpoint of light far down on the horizon. In a moment he rushed to the beacon, and a match flared against the waterproof match safe cupped carefully between his hands.

The tiny flame bit into the débris, and the night breeze, stirring gently, fanned the fire into a roaring, crackling blaze that dispelled the gloom, and cast ruddy, intermittent jets of light on the eager face of the watcher. In the illumined area, he danced, leaped, and gesticulated wildly.

He ripped down the canvas awning, and fastened it to his heavy fishing rod. Then, keeping between the fire and his objective, and standing in bold relief against the flames, he began waving his pennant with long, regular strokes.

Minute succeeded lagging minute. The hours fled away. The beacon and every available bit of fuel that Wimble could find in the dark had been utterly consumed. Pearly dawn waxed.

Wimble, who had kept vigil throughout the night, now searched the horizon with red-rimmed, fearful eyes, seeking to penetrate the thinning vapors that come with the light.

The far line was unbroken.

Slowly, and with contorted face, Wimble sank to his knees, his shoulders bowed down as if with a great weight.

But Wimble was made of resilient stuff, and had too much fortitude to devote much time to self-pity. He set to work to make himself as secure as possible.

He hauled in on the raft, and got one of the empty hogsheads aboard, filling it laboriously, a bucket at a time, from his small reserve, behind the shack, and the few drippings yielded by the oft-pierced stalks of the Traveler's Palms. He secured the scant remainder of his tinned stuff, which, by dint of unconscious sparing, he had made to last beyond the allotted time.

He tethered the raft by a very long cable to the highest point he could find, for he knew the folly of pushing off to the open sea. Though the island should disappear, the raft would float, and mark its exact location, the bearings of which were in Burnell's possession.

It was fortunate for Wimble that he took these precautions, for three days later, after further rumblings and heavings, the atoll was completely awash.

Wimble, well fixed aboard his raft, now began his long vigil for the long overdue schooner. His valuable data were secured in the watertight jar, his food and water stood to hand, and he had rope enough to pay out to the submerged island below him, so long as breath persisted in his body. In his possession was this boon to humanity, and Wimble fiercely determined to hold out to the utmost.

DOCTOR WIMBLE found himself in this desperate plight just a month ago. If he is possessed of any telepathic powers, he may now be aware of the fact that Burnell will never return for him.

After depositing Wimble on the atoll, the schooner touching briefly at Maui, sailed off into the limbo of lost ships. "Squareface" Burnell himself was found dead with a knife in his back in a drifting ship's boat, with an expiring and unconscious Kanaka who tightly clutched an empty water keg.

As the dead man was the only one who possessed the clue to the atoll's exact location, not even the bank people in Papeete who opened the letter left by Wimble—following instructions when Burnell failed to show up—have any idea of the unfortunate man's whereabouts.

Word has gone out to the numerous craft that sail those waters—pearlers, traders, copra gatherers—to be on the lookout for Wimble; but so far, he has not sighted one of them.

Daily, as he grows weaker, he pays out a few inches, perhaps a foot, of rope, to the submerged island, reviling the name of Burnell, and wondering if he ought to trust the jar with its precious secret to the mysterious whims of the ocean currents. He fears it may be cast up on some uninhabited island, or fall into the hands of ignorant savages who inhabit the neighboring groups; and so he keeps it with him.

Shark fins cleave the waters about the raft; but Wimble has no more bullets with which to break their backs; although he still holds on to one, which he fingers avidly, now and then. There was once a light, he remembers. It may come back this way.

But for the fact that Burnell knew the atoll's location, Wimble would cut loose and take his chances of being wafted in waters more frequently ploughed by inter-island traffic.

We can do no more than hope that fortune will yet favor the intrepid little scientist, although it looks very much as if people for untold generations will have to go on complaining, "Oh! That drill! That awful drill!"

Wimble, who had kept vigil throughout the night, now searched the horizon with red-rimmed eyes, seeking to penetrate the thinning vapors that come with the light.

THE END

The WHITE

PERHAPS it is because the human mechanism is not new that we treat it with such a vast amount of indifference. Any layman would evince some interest in the mechanism and workings of a new machine brought before his attention. But of the organs of our body, because they are so much a part of us, we know nothing, except in time of trouble, when our attention is forced to specific parts. Yet the human machine is the most marvelous machine ever created. It was less than three centuries ago that Harvey discovered that the blood circulates through our veins and arteries. Our new author, without a doubt, knows his subject, and what is just as important, he can transmit his knowledge in a most absorbing manner. We are sure you will be glad, with us, to add Dr. Dressler's name to our growing list of worth while contributors. We shall be glad to hear from him soon again.

LEUCON presented a queer picture as he clung to a projection of the wall in the cavity where he awoke, and cast a bewildered and somewhat frightened look at the scene around him.

In shape he seemed rather like a globe, but as an eddy in the current, that swirled through and around his retreat, swung against him, he belied this impression by flattening into a disc, holding fast to his perch with one clawlike tentacle. A moment later he writhed into an elongated cylindrical shape, although still with the tentacle firmly fast to his anchorage. In another moment, and without losing his grip, he became a coma-like affair and then once more like a ball. Closer inspection with these changes in mind might have shown that he underwent his metamorphosis at will, having evidently instead of arms and legs and head and body a plastic sort of corpus or body that might assume any shape, that might grow a leg or arm or mouth or head as he desired, and just as easily return to his torso proper when it suited him.

Of skeleton he had none in the proper sense, although he did have a sponge-like network or reticulum of slightly harder matter than the rest of him, that pervaded his whole substance and served the same purpose.

Scattered at certain points in this framework were numbers of dully shining neutral colored specks of matter that resembled a number of dark pearls in a network of lace. They were each, however, carefully disposed at a crossing of two strands of the reticulum or net, something like joints in a wire screen.

Of brain he had some, a great deal in fact compared to the size of his body, but it was in a queer place, none other than in the center of his body. It was darker and heavier than the rest of his substance and seemed most often shaped like a three-legged dumb-bell, although as his body changed shape, the brain changed, becoming now short and thick and then elongated, until the central connecting parts were so threadlike that they seemed to be absent.

He had a skin to be sure, or at least a denser membrane that was in the proper place for skin and seemed to serve the purpose. But it was more adaptable than most skin because it could not only feel and move, but it could see, or serve the same function for Leucon; it could become a claw or mouth, an arm or a leg, at any point and at any time. It had no definite color as most skin has; it was neither white nor drab nor yet wholly transparent, but rather without any color whatever. This latter property it shared with all of him, except for the granules in his skeleton and for the dark mass that was his brain.

In size Leucon was large compared to the other animate beings he saw, all of eleven or twelve microns in diameter when he was at rest. True, when he stretched himself to his fullest extent he was much longer, but that was at the expense of his girth. What he weighed I do not know, but thirty thousand like him could be in a cubic millimeter of space and still leave ample room for five millions more slightly smaller creatures without undue crowding.

After swinging from his mooring post for a while, Leucon lost some of his bewilderment and since he was a sentient being with not a little curiosity in his make-up, he commenced to look about and appraise his surroundings.

HE found that he was in a sort of cylindrical grotto with regular walls, made up apparently of blocks laid together with a smoothly shining cement between them. The grotto was not large, hardly big enough to contain more than two or three like him. At one end it was closed, the walls ending in a blank surface; the other end was open and in and out this opening surged the tides of fluid that bathed him and everything within his range of vision. They came and went in regular rhythm, yet at no time was the space empty; on closer inspection he saw that the walls of his room seemed to yield with each influx and contract with each outgo, yet all so quietly that at first he failed to notice it.

The fluid, he saw, was not the clear substance that it seemed at first glance, but contained numberless tiny fragments that looked like débris of some sort, but that upon second thought he decided to be something different. One fragment swung against the portion of his body away from the wall and smelled so inviting that he promptly ate it. He did this in a peculiar way, first seizing it in an outflung tentacle and then rolling around it. The skin next the fragment opened and closed and the fragment was inside of him. Presently he began to digest it and enjoyed it so much that he looked about for more. Several came close enough to be taken the same way and then one particularly large and tempting piece eluded him until he cast loose from his anchorage and literally ran it down.

After he had finished his meal, he found that he was close to the entrance of his cave and as the next outrush of tide came nearly swung out with it. He was close to one of the walls and he caught hold and clung while he reconnoitered the territory beyond. He found that by lengthening his anchoring pseudopod or foot-like tentacle and stretching a bit, he could remain in his quiet nook and at the same time observe the scene that the entrance looked upon.

He seemed to be facing a shining tube, many times larger than his own grotto, cylindrical and interminably

The WHITE ARMY

By Dr. Daniel Dressler

Illustrated by Hugh McKay

PERHAPS it is because the human mechanism is not new that we treat it with such a vast amount of indifference. Any layman would evince some interest in the mechanism and workings of a new machine brought before his attention. But of the organs of our body, because they are so much a part of us, we know nothing, except in time of trouble, when our attention is forced to specific parts. Yet the human machine is the most marvelous machine ever erected. It was less than three centuries ago that Harvey discovered that the blood circulates through our veins and arteries. Our new author, without a doubt, knows his subject, and what is just as important, he can transmit his knowledge in a most absorbing manner. We are sure you will be glad, with us, to add Dr. Dressler's name to our growing list of worth while contributors. We shall be glad to hear from him soon again.

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ARMY

By Dr. Daniel Dressler

Illustrated by Hugh McKay

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long. Its walls were not unlike the ones he had already seen, save that the blocks were longer and narrower and less regular in shape and were each very thin; so thin that he could see through them to other supporting structures more firm and white and less closely applied to each other. He saw where the tidal waves came from. The tube was filled with the same rushing fluid and it swelled and shrank with each pulsation in the current. He realized that the place was lighted, walls, fluids, everything was bathed in a dull greenish glow, that was reflected from the shining walls and dispersed in the current.

As he swung to his anchorage and looked at all the new and strange things, his attention was caught by an object in the fluid, larger and more solid than his food particles. It drifted toward him and he drew back with a start of alarm to see a round object, disc shaped with biconcave sides, rolling and tumbling in the current directly toward him. He drew back and watched it for a moment when he saw with a breath of relief that it was drifting past without any apparent designs upon either himself or his refuge.

Now that he had seen it, he found that there were many of them, and he saw, too, that they gave much of the greenish light he had observed. They drifted along like little living torches, diffusing a soft glow about them.

Nor were they the only freight upon the current. Along the opposite wall was a whole series of porpoise-like objects, some of them as large as he was, great round pudgy balls, white on the outside with heavy dark centers occupying nearly their whole form. In, between and around the shapes he had seen first, were multitudes of tiny discs dodging and darting about as if in a great hurry, though never getting much beyond the usual speed of the current. They looked like smaller editions of the first, save that they were flat-sided instead of hollow and were without lights.

While he hung to his anchorage wondering what might appear next, he was startled to find something attached to the same point and to hear a hearty voice in his ear.

"Hello, Leucocyte, how are tricks?"

He drew up in some trepidation and turned to observe the source of the voice.

CLOSE beside him, in the mouth of the cave, he beheld a replica of himself, identical in appearance save that the newcomer was slightly larger and rather scarred of skin and had, instead of a sprinkling of granules through his substance, a literal load of them; every joint in his framework was starred with one. He grasped Leucon's anchorage with a tentacle just like his own and swung in the current with the same easy motion. Toward Leucon he presented a facet-like protuberance that very evidently was for the moment serving as an eye, and which glimmered and twinkled very much as a real eye might have done. Leucon's first impulse was to flee from this new being who seemed interested in him, but a second look disclosed no symptoms of aggressiveness, so he held his position and replied:

"Why do you call me Leucocyte? My name is Leucon. I found myself in this cave and I've had something to eat, but everything is new and strange and I don't know exactly what to do. There are a lot of queer monsters outside and they might be dangerous."

The newcomer laughed indulgently.

"I see you are a new one, just born and with everything to learn. Well, my name is Poli; we are both Leucocytes, Polymorphonuclear Neutrophiles if you want our family name, although we usually answer to 'Leucocyte' or just 'White.' Of course, they include us with all the other Leucocytes when they say that, but maybe it is more of a compliment than anything else, since Metchnikoff really paid more attention to us than to any of the others. I won't say that some of them, the Eosinophiles for example, are not pretty good chaps. They can fight protozoan infections better than we can."

In the face of so much that was new and with so much evident knowledge from one that he instinctively judged a friend, Leucon felt more bewildered than ever, but he found courage to ask a question or two.

"But what do you mean by 'Metchnikoff' and 'Eosinophiles' and why should we fight anyone? I really don't feel like it. It's quiet here and I don't see anything to fight."

Poli laughed again and then gave vent to a low whistle of amusement.

"Well, you *are* green, aren't you? You don't even know that Metchnikoff is the fellow who gave the world the first insight into our importance with his theory of Phagocytosis. Eosinophiles, large and small lymphocytes, and transitional cells, are our first cousins and they help us fight infections and repair damage and keep the place policed up.

"You ought to be proud to belong to the polymorphs. We are the standing army, the ones who go everywhere and do what is to be done, fighting, repair work, scavenging, and helping in digestion, although they usually have temporary help for that. Why, we are the only cells in the body who have passports that admit us anywhere.

"This little place is only your nursery; it's a space in the white bone marrow where you and I and a lot of our brothers were born. Further on in the bone is red marrow where the erythrocytes, those flat disc-shaped helpless fellows, develop. The rivulet that you have been eyeing with so much trepidation is nothing but a vein that carries out the blood coming in by the nutrient arteries. This liquid is plasma; out there where the cells are, it is blood. Simple, isn't it?

"But then I know how it is when you are new; everything is strange and a little terrifying. When you've been around as much as I have (this last with some pride), you'll know some things.

"Don't ever forget that you are a Polymorph and that you are the equal of anyone in a fair fight. There are not so many of us, only about three thousand to the cubic millimeter, while there are almost as many other leucocytes and about five million reds, but we are the army and if we call out the reserves, we can build our forces up to thirty and even fifty thousand."

Somewhat heartened by this friendly explanation, Leucon quite welcomed Poli's next words, which were an invitation to make a trip "around" with him.

"There is nothing much doing right now, I might as well show you the ropes." Poli remarked. "You won't know what to do if you meet trouble, so we may as well trail along together. It's tough to travel alone. I used to stick with a chap called Neuto, but we got separated and I've never seen him since."

WHILE he spoke, Poli was casting loose from his anchorage and rolling into a ball. Leucon imitated him and together they rolled to the opening of the cave where Poli cast boldly into the current. Leucon felt for a moment some of his old timidity, but rather than be

left alone he, too, rolled over and over and into the stream and presently was drifting by Poli's side.

On every hand he saw the disc-shaped lantern bearers that he now knew as red cells, rolling and tumbling along in a manner quite helpless and yet not without a certain dignity. Between, and around them, were their miniature fellows, who, he now saw, were quite pale in color; indeed, they were little more than dense places in the fluid. As he watched one, it seemed to melt and then become semi-solid again, while another beside him vanished and did not return.

Observing his interest in them, Poli remarked:

"Those little chaps are blood platelets. They are always on the verge of going into solution and sometimes they do. They are always present in blood and they furnish an indispensable component of fibrin, which is the essential part of a blood clot.

"There are a lot of reds here. Their proper name is 'erythrocyte,' 'erythro' meaning red and 'cyte' for cell. They are the coloring matter of the blood and they carry oxygen and most of the carbon dioxide, although some of it travels in solution in the plasma in the form of soluble carbonates. The reds are nice chaps but no good as fighters. They die like sheep in the presence of invaders. And, too, they are very short lived. Why, they die naturally in seven days while we go on many times that long, if we don't pass out in a scrap.

"But when there is trouble, we suffer. In the last fight with organisms from the Outside, we lost quite a few millions of the regulars, besides a bunch of emergency troops. I came on the scene late, else I would probably have gotten mine. Most of the bunch stayed and became food for connective tissue cells, but I was young and strong and decided to pull out."

Leucon had been lending all his attention during this discourse and he found so much to think about, that he suggested that they anchor awhile. Poli agreed, and noting a ledge in what seemed a slight recess in the tunnels, they thrust out pseudopods and attached themselves to it.

There was just enough of a recess to their wall to take them out of the rush of the current and only an eddy swung them gently to and fro, throwing a few of the blood platelets and smaller fry in the stream against them while the red cells and larger objects swept past beyond. Across the channel the wall swelled in a similar way and above and below them the same.

"This is just a dilatation in the vein," Poli remarked. "They occur frequently, why I don't know, except that they are a good place to loaf and watch the passing stream. But you must never gang up here with a bunch of Leucocytes, one or two is all right, but more would start an obstruction."

"What did you mean by 'Organisms' and 'The Outside?'" Leucon asked. Poli shifted his grip a little on the anchorage and settled more comfortably, then answered:

"You know we are only a couple of corpuscles, even if we do belong to what we consider about the most important group of them; we and all this fluid, the reds, other whites, and platelets are components of the blood. These walls beyond us make up a vein; beyond it are muscle and connective tissue and bone and nerve and skin; in short, an enormous amount of other cells that make up a body. This body is called a man and he lives and moves in a world that is quite beyond our conception. What he does there I do not know, but I suppose that just as we have our sphere and function, so does he have his.

"By 'Outside' I mean the part beyond the skin and in the alimentary tract where we sometimes help absorb the food that we, as well as the man, depend upon for our existence. I've heard that the man considers his alimentary tract to be within him, but, of course, it isn't. It is developed from ectoderm, just as the skin is, and it's really outside of the body proper, even if it does seem to be within. Food in it is still outside. We never go outside except sometimes when there is an injury to repair and then we rarely live to come back. When we die Outside, I once heard a brain cell say that the man calls our dead bodies pus. What he meant by that, I don't know.

"The skin keeps the rest of the body pretty well protected; it is a very efficient armor. Sometimes it gets broken and then we not only have to repair it, but we have also to fight the organisms I spoke of. They are active little chaps of different shapes and sizes and they are mostly of the vegetable world, only a few being of the animal or protozoan sort. But one and all, if they are pathogenic or disease producing, they have confoundedly active jaws and teeth. They don't bother when the skin is intact, the skin cells are immune to most of them, but if they once get through and start to multiply, they are dangerous. We handle most of them, and when we can't the brain pushes up the body temperature and though that's uncomfortable for us, it usually fixes them."

"How do you kill these organisms?" Leucon asked. If I'm to do that sort of thing, I'd like to know how to go about it."

"In different ways," Poli answered. "Usually we eat them, simply envelope and digest them. But sometimes

At one end it was closed, the walls ending in a blank surface; the other end was open and in and out this opening surged the tides of fluid that bathed him.

they employ toxins, tiny poisonous molecules that are an awful nuisance, until someone learns to produce an anti-body to neutralize them. We do a lot of that work, although the rest of the body cells help, too. After we know just how to prepare these anti-bodies it's easier, but before we do, it's sometimes a hard scrap. You will learn all that when the time comes, so don't worry about it until then."

AS he finished speaking, Poli drew into a ball preparatory to casting off, and Leucon did likewise. During an interval between pulsations, they dropped into the current and side by side drifted down the channel. They had progressed a short distance when Leucon perceived an opening in the side of their tunnel, and through this another current rushed, mixing with their own and taking them suddenly to a point where the vein enlarged to nearly twice its former size. The same current churned them along and the fluid kept much its same characteristics, save that there seemed to be more of the red cells and less of the white and the liquid portion seemed slightly stale in odor.

"A branch from the muscle," Poli said. "Few whites go through there unless there is trouble, but muscle uses a lot of oxygen and food and sends back a lot of waste. We go in there usually only once in a while unless there is trouble, but it needs plenty of reds to keep the oxygen balance up."

They progressed in the larger tunnel for a time, when Leucon perceived that it was rapidly coming to an end. It narrowed slightly, the speed of the current increased and they debauched suddenly into an enormous vessel, its walls so far apart that they could barely see them. There was the same onward rush of the current but the pulsation was less evident; they seemed to Leucon to be drifting down a steadily flowing stream in a huge and dimly lighted cavern.

From time to time he perceived the mouths of other tunnels all emptying their contents into the main channel, and each adding to the swarm of reds and whites and platelets that he saw on every side. The openings were not regular. Sometimes they were close together and sometimes they passed for some distance without seeing any. Each seemed to enter at an angle that discharged its contents without affecting the current save to augment it, and he saw that after each influx the channel increased slightly in size so that the cavern became like the bed of a river receiving its tributaries and rushing toward the sea.

"This is the femoral vein," Poli said. "Presently we will reach the iliac and then the vena cava, the largest vein in the body."

And presently they did come to it, another slight narrowing of the walls of their cavern, another thrust of the current, and they were swimming along in a still larger tunnel. This carried them for a time and then emptied into one that seemed perfectly enormous. Above them was the widely arching roof and only as the current carried them toward one side or the other was Leucon able to see the walls. He presently noticed that tunnels entering seemed to be more numerous and that they usually occurred in pairs. Soon, though, they passed a number unpaired and in the exodus from these he noticed a sweetish tinge and myriads of tiny glittering crystals. He caught one and enveloped it and found it most pleasant in taste.

Poli ranged beside him and he, too, caught and swallowed some. "Sugar crystals, glycogen molecules from the liver," he said. "They are the principal food for most cells and we eat them sometimes, although you will often have to depend upon debris from broken down tissue when you are at work. Here in the blood stream there is little of that to be found and a good meal is always worth while."

While he was eating, Leucon had paid little note to his progress, but he soon became aware that their speed had increased. He realized, too, for the first time, that there was noise audible. Instead of flowing along quietly, the current now swished and thudded against the walls; the former rhythmic pulsation had become a continuous booming roar so that even the far flung walls of the cavern reverberated to it.

SUDDENLY hesitant, frightened by the din, Leucon would have made his way to the wall and anchored, but when he attempted it, he found that he was helpless. Pushed by the fluid, buffeted by the smaller cells, he rolled hither and thither and all the time impelled onward until even the pandemonium that had first frightened him was lost in an all-pervading roar and a rushing to and fro of the current that left him half senseless with terror. He dimly realized that he was in a huge chamber whose walls alternately contracted and expanded with a beat-beat-beat unlike anything he had ever imagined. Below him he saw a huge trapdoor with three leaves, that opened and shut with each contraction and expansion of the chamber. Even as he perceived them, he was rushed toward them and with a surge of horror knew that willy-nilly he must go with the current. Visions of his helpless body caught and crushed between them flashed through his mind and next moment he was hurled directly toward them.

To his infinite relief, they opened in time and before they closed he was through and in a second chamber larger and noisier than the first. The same contraction and expansion went on and he saw below him another door exactly like the first. Caught in a wave, he had little time to be frightened before he was impelled through it and into the comparative quiet of another tunnel.

True, there was still noise and hurry, but the tunnel looked not unlike the ones he had traversed with Poli, and although the tide was much stronger and the pace more rapid, he felt almost at ease. He gave a hurried inspection of his body and, finding no damage, grew more calm and for the first time since his advent into the scene of furor bethought himself of his companion. To his surprise, he found him still at his side and apparently in no way perturbed by the doings of the last few moments.

Hs grinned cheerfully at Leucon and said:

"Well, how did you like that? We just passed through the heart and now we are in the pulmonary artery leading to the lungs. Were you frightened?"

Leucon admitted that he had been and Poli grinned once more and continued: "You had a right to be. It's a trying experience the first time, but I didn't want to frighten you by telling you about it beforehand. You see, despite all the noise it's perfectly harmless; all the blood in the body goes through there once in seven minutes and no one is ever hurt. Even if those terrible looking valves did close on you, they'd do no damage; they are covered with endothelium just like the soft lining of these vessels.

"Now," as they continued to drift with the current, "ahead of us are the lungs. You won't find much of

interest in them as there is seldom any work, but we are started and may as well go on."

A FEW moments only it seemed to Leucon before their pathway divided, one part of the stream following a vessel to the right and the other a smaller one to the left. Still together, they drifted into the left-hand stream and presently found it, too, dividing, then almost immediately breaking up until they were in a tunnel so small that they were forced to proceed single file. Just ahead and behind them were numbers of red cells, but no other whites were in sight. The passageway narrowed still more and Leucon was forced to squeeze himself into almost a cylindrical shape to creep through. Encouraged by Poli he did so, and soon found himself in quarters so constricted that even the smaller reds were hampered. He became conscious then of a roaring sound, rhythmic and slow, barely one-third as rapid as the noise he remembered in the heart.

The current, too, had become less rapid and he had a moment to observe things about him. He saw on one side only the customary vessel wall, but on the other were numberless tiny pockets into which the red cells were eagerly crowding. The walls of these pockets were thin, so thin that he could see right through them into what seemed a vast dark space. As each red cell came against this wall, it paused a moment and seemed to stick fast with a portion of its body. As he watched one, it seemed to swell and shrink like a fat man taking a deep breath. Then he noticed that it was giving off some sort of gas, colorless, but evident in minute bubbles. As soon as it had ceased to discharge gas, it began to imbibe another load, seemingly right through the wall, This last turned its body from the dark, almost purple red, that it had been, to a brilliant crimson while its iridescent glow brightened until it became a gleaming ball.

"The reds are getting rid of their carbon dioxide and taking on oxygen," Poli explained. "That's their job, you know. They pick up CO_2 in the tissues and trade it here for oxygen which they carry back. They get it through the membrane cells there by a system of osmosis and some vital characteristic of the cells, from the dark space that you see and which is Air from Outside. See how much fresher everything seems now that there is plenty of oxygen around?"

And, indeed, Leucon felt as if he had imbibed some invigorating draught.

After a moment they pressed onward through the vessel, squeezing past the reds who were slowly moving along the walls. The way became blocked and they halted and looked ahead to see a number of reds and one or two lymphocytes heaped together in a mass and completely closing the passage. The walls of the vessel were stretching, but the press became momentarily greater and the jam more solid, until reds behind piling up completely hemmed them in.

Poli exclaimed in anger, and stretching into a sinuous ribbon, commenced wriggling through the mass. Leucon followed him and presently was twisting over three fat and ponderous red cells that were jammed helplessly across the way. He would have gone on, but Poli stopped, and thrusting a pseudopod under the first of the three levered strenuously in an effort to dislodge him. Leucon moved to his assistance and together they heaved the red forth, breaking the jam and releasing the crowd behind. Poli flattened against the wall and allowed them to pass before he spoke.

"Those confounded reds can't seem to get through even a lung capillary without getting jammed. You find them doing it all the time and if you don't get them out, the first thing you know there is an intravascular clot which means a lot of work closing it off and cleaning out the debris. You want to watch for them, not only in the lungs, but even more in the skin and soft tissues."

As he talked, they drifted easily along with the current, debouching presently into a larger stream. This in turn gave way to one still larger and they were in a cavern so immense that Leucon could not see its walls. Their speed increased and he noted a return of the roaring noise.

"Approaching the heart again," Poli shouted, "only this time we are in the pulmonary vein and we shall go through the left side and out the aorta."

Presently they shot once more into the boiling current and thunderous clatter that he remembered so well. But this time it was less terrifying and Leucon was surprised to find he was through and gliding down another large tunnel that swelled and throbbed with each impulse of the mighty engine behind, before he had fully realized that he was started.

As they passed the last changing valve, Leucon became aware of a curious odor in the fluid around them, an indefinite something that seemed to awaken a response in him, without a tangible appeal to his physical sense. It seemed at first an odor, but changed in a moment to a thrumming vibration to which his being was attuned—a not unpleasant sensation and one which he felt ought to convey something to him. A moment later Poli noticed it and swinging over to him remarked: "Digestion is on, did you notice the hormone in that last bunch of blood, Leucon?"

"I noticed something," Leucon confessed. "I seemed to feel an urge to go some place and do something, although it's not at all clear. It seems now as though we are headed in the right direction."

Poli chuckled. "You will learn to recognize those messages. They are hormones and one of the chief ways, besides chemotaxis when we are in the neighborhood of trouble, that we get orders. You see, every organ in the body gives off a secretion that is peculiar to it alone, and in case of injury or bacterial invasion, or other trouble, not only does the blood supply to that organ increase, but we recognize the changes that take place in that secretion, and as many of our fellows as can, hike toward it to help out. Now this that you notice is only a signal that down in the small intestine absorption is going on and there is some fat that we must pick up. It happens regularly and you will have to help sometimes. Other stuff is absorbed by the intestinal walls, but fat is picked up by leucocytes and carried to the lymphatics. We will soon come to the opening of the superior mesenteric artery. This that we are in is the abdominal aorta; we shall go and help."

The opening that Poli spoke of soon came in sight and swinging with a surge of the fluid that flowed toward it, Poli came to the edge and shot in with a brisk movement of a pseudopod. Leucon, however, hesitated an instant and an inopportune thrust of the current caught him and sent him past before he had time to realize what was happening. Terrified and somewhat angered, he writhed in frantic spirals and lashed with outflung tentacles to reach the opening, but the current was too strong; another beat or two and he was far past, gliding down the tunnel toward he knew not what.

Left to His Own Resources

FOR a time after he lost contact with Poli, Leucon felt something of his old fear at each new experience that he faced, no longer buoyed up by the other's knowledge and ready council. After a time, however, he lost his timidity and began to enjoy life, finding a definite pleasure in exploring the highways and byways of his world and gradually assuming duties that he hardly regarded as labor, but rather as things that it seemed fitting and proper for him to do.

He learned to watch for breaks in the continuity of the walls of his tunnel highways, and to tear away and digest cells that broke down under the continuous battering of the current. Behind each one as it died and came away would appear a new one, ready formed, to take its place and help maintain each element of the circulatory system in perfect repair. He learned to squeeze through these living walls so skilfully that they were not even disturbed, and to traverse vast distances through muscle and tendon and fat, lending a hand here to support a weak spot and there breaking down and tearing away tissue cells that were diseased or worn out.

They seized masses of material larger than themselves and bit and tore at them, breaking them up and scattering the pieces about.

Always after these excursions he made his way back to the blood stream, sometimes by way of the lymphatic spaces, tunnels in miniature not unlike the blood vessels that he knew so well, save that they had no red cells and multitudes of his cousin lymphocytes, but usually by capillaries that brought him directly to the larger streams. At first the thought of climbing through apparently solid tissue seemed difficult after his easy and rapid progress with the blood current, but he found that there was always space around even the most densely packed cells, and where he could push a pseudopod the rest of his mobile body could follow. Ease came with practice and he soon performed his "migrations," as he termed them, with perfect facility.

These migrations, he came to realize, were not haphazard on his part. In addition to the impulses that came to him from time to time by way of the hormones, he was frequently aware of a definite urge to leave the vessel in which he happened to be and travel through tissue or blood to some point where his services were required. At times this urge became a pull which he was powerless to resist even had he wished to, a driving impulse that carried him without volition or thought on his way. When he encountered it, and it always seemed to reach him when he was in a small vessel or capillary, he did not stop to question. He thrust a tentacle between the nearest two cells and dragged his body after. When he reached the spot where work was to be done, the impulse ceased, and when the work was finished he departed for the nearest blood vessel. Long after, he came to identify this property as the chemotaxis of which Poli had spoken.

Not all of his time was spent in solid tissue or in the blood stream; he wandered through apparently endless channels and visited many organs. He entered the brain and marveled at the great stupid looking Purkinje cells that floated in their jelly-like medium passing along their bodies and processes, a constant stream of vibrations, that one of them told him were the thought impulses of the man whose body they helped make up. He visited the liver and saw the curious triad of artery, vein and bile duct with the long strings of liver cells radiating out like the spokes of a wheel, cells that took sugar from the portal vein and made it over into glittering granules of glycogen, and that caught and broke down aged for damaged red cells to make pigment from their bodies. He liked neither liver nor brain; the temperature to his thermo-sensitive body was too high—almost two degrees above the rest of his world—and he avoided them when possible.

AT times, when the summons found him unoccupied, he answered the call to aid in digestion, floating down the tunnel at whose mouth he had lost Poli, and down it until it branched into a multitude of capillaries so small he could barely move in them. These tiny vessels branched from their parent stem like fingers from a hand, and their walls, only one cell in thickness, separated Leucon from a dense black liquid mass that moved by under the urge of rhythmic impulses from above. In this mass were numberless fragments that looked like food to Leucon, but food so unlike what he had always known that he could not be sure of it. Ever and anon, though, there floated against his wall tiny droplets of what he knew to be fat, and as one came near him, he thrust a pseudopod through the wall and engulfed it, bringing it through the wall and holding it in his body until he had accumulated all he could carry. He then backed out of his vessel and crawled to another conduit passing a tiny stream, this one of clear lymph. Squeezing through the walls of the conduit, he clung to one of them and unwrapped himself from around the fat droplets, depositing them in the current where they floated away to join a multitude of their fellows.

Leucon once swam away with this lymph stream and found that it carried him through larger and larger channels, much like the familiar blood vessels, until it emptied into one of them a short distance from the heart. Usually, though, he stayed at his work, catching and herding the fat droplets.

As he became more familiar with his duties, he had more time to look about and presently saw that besides

the fat droplets and other material in the dark mass were many animate beings. Literally hosts of tiny rodlike objects, with a head made up mostly of teeth projecting at one end, a smooth cylindrical body and a corkscrew-like tail, were darting about in the fluid. They seized masses of material larger than themselves and bit and tore at them, breaking them up and scattering the pieces about. Sometimes, when a particularly large chunk resisted all their tearing efforts, two or three would cling to it, crowding against it and apparently emitting some melting fluid from their bodies, for the piece would presently break and the tiny objects would triumphantly swim away, each with a piece to be further dissected. He noticed that the tiny organisms never attacked the fat droplets, always bending their efforts upon the material that he finally concluded, from its resemblance to structure that he knew, to be protein. He later found this to be true. A casual conversation with another Leucocyte disclosed the facts that the dark mass he saw was the contents of the gastro-intestinal tract, the fat droplets that he helped secure, the supply of fat for the body's use; the material that the organisms struggled with were pieces of protein that had escaped digestion above and were being broken down by the tiny germs that were themselves the mutual parasite Bacillus Coli.

Later, when helping to absorb fat had become a regular habit, Leucon dropped into something of a routine. He drifted with the blood stream and did what work he saw; at intervals he repaired to the intestinal wall; he ate when the mood took him and food was at hand; sometimes he slept, or at least, rested in some quiet nook for a time.

He talked with other Polymorphs occasionally, for he was not an ungregarious creature, and even entered into conversation with other cells. He swapped news and views with the flat membrane cells that lined the vessels and that he called endothelium, with the lymphocytes and red-starred eosinophiles in the blood and lymph streams and with tissue cells of all sorts. He saw more erythrocytes than perhaps any other variety, but he rather looked down upon them as carriers of wood and drawers of water and seldom condescended to talk to them.

DURING this period of gain in age and experience he changed somewhat in physical appearance. The granules in his body developed in number and in regularity of distribution until every joint in his reticulum was dotted with them. His nuclear structure became denser and more fixed in shape until it kept quite consistently the shape of three dumb-bells jointed at the center by a cord-like bridge. His skin became slightly thicker and more adaptable to its varying function, growing an eye or a mouth or a tentacle into which his whole body might flow with perfect ease.

And since outward changes in all living beings are not without their inward concomitants, Leucon developed mentally, or at least, in that primal consciousness that was his mind. His recollections of Poli were hazy, yet not wholly gone. He remembered other things, his way through certain tortuous passages and the way to perform certain work so that he definitely had a memory. He thought, too; that is, he remembered things from his past and applied their lessons to his present life and from the sum total deduced rules for his future behavior. By far the greater portion of his intellectual armamentarium, though, lay in a store of subconscious impulses, from which he drew when in doubt, and to which he added without conscious effort the significance of his daily contacts. He remembered at times Poli's words about fighting and he wondered if he would ever meet a hostile bacterium and how he would act if he did. But his subconscious promptings came only as needed and he could not draw the answer to a speculation from them.

He heard in his travels and contacts with other Leucocytes many names, most of them unintelligible, toxins and cytolysis, antibody and phagocytosis. He heard old Polymorphs discourse wisely on toxin molecules and cell receptors and on the best and quickest way to neutralize toxins and protect body cells. At first he paid little attention to the gossip, relying upon his conviction of instinctive knowledge, but later he came to take an interest and even to inquire a bit. He gleaned a few facts and from them and from his subliminal understanding, formulated a conception of what he might encounter when he faced a bacterial invasion.

BACTERIA, he learned, were of many varieties, some pathogenic, that is, able to damage the body, and some harmless. They gained entrance to the body through various channels, through nose and lungs and gastro-intestinal tract and other openings and through breaks in the body's armor, the skin. They were usually taken care of at their point of entry by local measures, only when the resistance of the local part was lowered by poor blood supply or by systematic disease, did they manage to make a stand and multiply. Their weapons of offense were toxins, molecules like tiny darts or arrows that engaged the food-taking portions of the body cells and paralyzed them; the property they possessed of dissolving and devouring body cells, cytolysis, and in their almost phenomenal fecundity. The body's defense mechanism lay in the phagocytic action of the leucocytes and to a limited extent of all cells, on the ability of the blood plasma or cells to produce antitoxin or antibodies to neutralize the toxins, the ability of the body to increase its temperature and so speed the rate of increase of bacteria that their virulence declined; and lastly, when all other measures failed, of walling off the infected part and so keeping the infection from the body as a whole.

Much of this information Leucon picked up during a resting period when he happened to choose a nook close to a couple of veteran Polymorphs whom he had observed before, usually together and usually, it must be confessed, doing more talking than work. Perhaps, he reasoned, they had done enough fighting in the past to warrant a little disregard for ordinary work. Or perhaps in the scheme of things, since they were obviously "educated corpuscles," they were not expected to do anything save fight. He envied them wholeheartedly and hoped that he, too, might some day become distinguished and wise.

At about this time he became aware of a vague urge for companionship and remembered with regret his parting with the friendly Poli. He made some friends among his own kind but never found anyone in whom he sensed the kindly regard of Poli, and he spent much time in scrutinizing the ones he met in the hope of seeing him, but never with success.

After a number of periods of digestion, by which, since it was a regular process, he had come to mark his days, he felt the longing in a more acute form. He wandered around with the blood stream, coasting as far as an artery would take him, only to squeeze through a capil-

lary and tissue into a vein and back to make the circuit over again. He made the trip a number of times and finally became conscious of something more in his turbulence than an urge to find an old friend. He realized that not only was he uneasy but that every Leucocyte he saw was scurrying along in an unwontedly hurried manner, while the blood stream, instead of its customary beat-beat-beat, had quickened, until it moved a half faster than before.

He was passing through the aorta, when he noticed the quickened blood rate, and as he drifted down the channel toward one of the iliacs, he noted other signs of something unusual. The air, or rather the plasma that was his air, seemed close and heavy, making breathing uncomfortable, while it seemed to have grown uncomfortably warmer. He recollected his trip through the brain and he remembered the increased heat there with distaste. The present instance, though, seemed different; along with the heat was a vague feeling of something that at once stimulated him and recalled all he had thought and heard and instinctively knew of fighting.

He made the circuit with the blood and started back up the vena cava, when he realized where the disturbance came from. As he passed the opening of the portal vein instead of the gush of sweetened, if somewhat stale, blood that he had always met there, he encountered a flood of noxious fluid that fairly swarmed with tiny darting objects that twisted in and out among the cells, occasionally striking at one but mainly hurrying along with the stream. Along with them came a hormone, clear cut in its message and peremptory in its command.

LEUCON shot with the current through the heart and back down the Aorta and joined a veritable throng of other Polymorphs that seemed bent upon the same mission as himself. As they swung into the mesenteric artery, he noted that it seemed larger than usual and the increase in size extended all the way through the smallest arteriole or subdivision. He intuitively realized that an excess of blood and many times the usual number of Leucocytes were badly needed some place down the line.

Growing more sure of his route as he progressed, even without the guidance of the crowd, Leucon swept down the main artery through a branch and straight into the appendiceal. Here, other than a slowing of the stream and a bit of crowding by the other cells, he noted nothing unusual, but as he approached the end where a multitude of tiny branches led off, he found trouble indeed and realized the source of the call that had brought him from his customary routine to a point he had never visited, and that had summoned the crowds of his fellows who were on every hand. He sensed a presage of battle and felt with a certain thrill of elation that he was after all to realize his destiny of strife, instead of wearing out his days in a round of commonplace duty.

The entrance to the end artery was jammed with reds and whites, the reds helplessly trying to float through, the whites twisting and wriggling over each other in an effort to get ahead. The current had lost its onward movement; each impulse from the heart pushed the jam tighter and each period of relaxation allowed a recoil so that the crowd of cells, the fluid, and the walls of the arteriole, wavered in a continuous state of oscillation.

The flat cells of the walls looked curiously enlarged. They had imbibed fluid until they were distended almost to the bursting point; their usual smooth surface was roughened and their chromatin network strained and tense. Between them, instead of the customary thin line of cementing substance, were great gaps through which fluid seeped with each impulse of the blood stream. Behind them the connective tissue and smooth muscle cells were feebly struggling to fill in the interstices and maintain the integrity of the wall, but the pressure was too great; fluid, and even erythrocytes, slipped around them and into the tissue spaces.

After a few moments of trying to force his way through the crowd in the vessel, Leucon found himself firmly hemmed in. He seized upon a convenient opening and wedged his way through the wall, twisting and winding between cells until he approached what he knew must be the small vein accompanying the arteriole. The tissue around the vein wall was packed with reds, some of them dead and many dying and all giving off so little oxygen that he felt stifled. There were a few Leucocytes, lymphocytes mostly, and an occasional Polymorph, none of whom were active. They lay among the reds, passive or asleep. He wondered at their indifference to their surroundings, but soon dismissed all such thoughts when he took in the scene in the vessel.

The crowd in the arteriole was as nothing compared to this, while the dead red cells and passive whites were few compared to the numbers in sight. The venule was packed from side to side and from end to end with broken down reds and whites and many that barely struggled. Around them were countless fragments of endothelium broken from the wall in patches here and there, and in the spaces between them were multitudes of the minute darting objects that he had seen coming from the portal vein. Such of the white cells as were alive were packed with rod-like objects they had engulfed and they seemed to be feebly working their way toward the larger vein. Some had swallowed too much; one, before his eyes, gave up the struggle of digestion and subsided into a quiescent mass, resting quietly among the débris of which he had become a part. Others continued pushing their way through, moving slowly, quite without their usual brisk energy.

The tiny darting objects Leucon saw, all came from one direction, from the beginning of the venule, whence the engorged Leucocytes were making their way. They came in swarms and some stayed to fly at every living cell in sight, while many more hurried toward the bloodstream end of the venule. They moved in a manner strange to Leucon, without fins or tail and yet faster than the current. They seemed impelled by some force like molecular dispersion, which was in fact their method of progress.

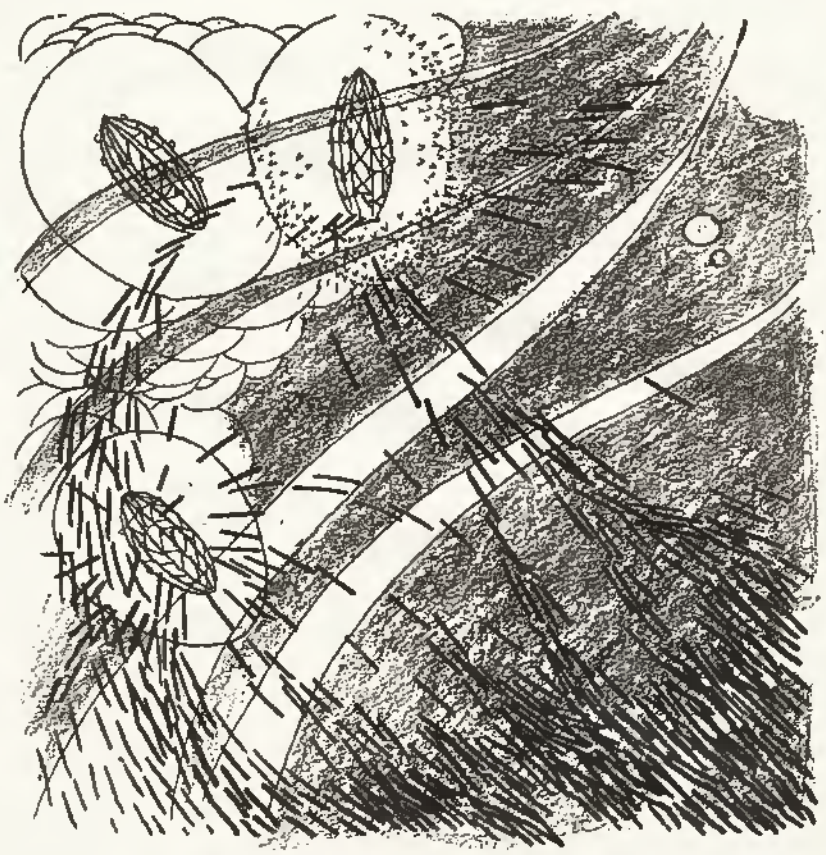
WHEN they flew at a cell, they always struck by one end and he saw that this end opened like a tiny trap which on contact closed and clung to the cell wall. They were small, so small that a few seemed to have little effect on the cell attacked, save to make it squirm, but when numbers found a foothold (or rather a mouth-hold), they seemed to hamper the cell's movements and finally to paralyze it. Many of the endothelial fragments lying about were quite covered with them while some of the most lethargic, and all of the dead Leucocytes, bristled with darts like porcupines.

Leucon, after he had watched from the wall for a

moment, pushed through and rolled into the middle of the venule. Immediately he had done so he snapped into a ball and tingled throughout his body in mingled fear and anger. One of the tiny darts had struck him and for the first time in his life he knew pain, sharp agonizing pain that burned to the center of his being. He attempted to draw away from it, but despite his every wriggle, it clung to its hold. He then, since his chief means of action lay in his amoeboid ability, tried to flow around and engulf it, but he found the portion of his body where it clung strangely numb and quite helpless. After a moment the pain subsided and he drew to the wall and crawled into a nook to think, the dart making no further move, save to tightly hang where it had seized.

Leucon's first reaction to attack had been fear. When the pain subsided, he became angry and a moment's cogitation gave birth to a firm resolve to rid himself of the attacker at any cost. He saw that the object had really only a minute portion of his skin in its jaws and he also saw that these jaws were locked in their place. Obviously, if he were to free himself, this portion must go and with a determined thrust from within he cast it off and saw the dart float away jerking and turning, but still with the fragment fast in its jaws.

He surveyed the damage to himself and found that he missed the lost portion not at all, while the pain and numbness were entirely gone. He felt a distinct sense of triumph at his victory and felt too, a return of the urge which had brought him thus far and which he had quite forgotten in the encounter. Swinging from the wall, he moved up the stream, passing dead and dying whites and reds in increasing numbers. There were multitudes of the tiny darts and some attacked him, but he was now prepared, and met each with a fragment of skin that effectively blocked its jaws. After a few encounters, he found it easier to meet them with a fragment of skin ready prepared, and he began to bristle with tiny points and even to cast some of them off to meet newcomers.



There was ample evidence that the battle waged. Débris of cells and tissue floated down and other engorged Leucocytes came from time to time to lick their wounds and regain strength.

ROUNDING a turn in the venule, he saw a dense crowd of Leucocytes, Polymorphs like himself, blocking the passage from wall to wall. They twisted and turned among themselves but always maintaining a solid rampart of flesh, a rampart against which something on the other side seemed to be struggling. Occasionally one would drop out and drift away and immediately another would swing into its place. The ones that fell out were each packed full of the rod-like objects, while every portion of their surface was covered with clusters of the tiny darts. Some struggled as they drifted, others were quiet as though paralyzed.

An opening appeared before him, and he stepped into it to find another layer fronting him. In this stratum, too, he saw a niche and he squeezed into it, elbowing out a fellow who seemed willing to leave.

On each side and above and below were Leucocytes like himself; in front he saw a perfect host of the rod-like creatures. The latter came from farther up in the venule and swam down in swarms to throw themselves in vicious abandon upon the living wall of Leucocytes. In size and general appearance they resembled the colon bacilli that Leucon had seen during digestion, save that their heads were larger and their jaws more fiercely armed. These heads were dragon shaped, the jaws opening widely and were fitted with two rows of jagged teeth. Each head blended into a short rod-shaped body that terminated at the other end in a minute flat tail, by which the organisms sculled themselves along.

Leucon now saw where the dart-like creatures came from. Each bacillus from time to time emitted one from his body; it sprang like Minerva, full-grown, and straightway shot toward the nearest cell in attack. Some missed their first objective and these dived between the Leucocytes or between the wall cells to emerge behind the barricade and so gain the blood stream. Memory of what the two educated Leucocytes had said came to Leucon and he recognized the tiny objects for what they were, toxin molecules eager to engage the receptors of body cells. He realized too, with a thrill of pride, that his expedient of a fragment of skin that stopped their avid jaws was the answer to their menace, an *Antitoxin*.

He had little time to meditate. He had barely gained his place in the wall when the first of the bacilli advanced upon him snapping his jaws and heralding his attack with a rush from a newly fledged toxin molecule. This latter Leucon quickly neutralized and he met the bacillus with a hastily outflung pseudopod. The jaws closed upon it, giving less pain than he had anticipated and the next moment he had rolled himself around the tentacle crushing and engulfing the foe. He found little trouble in digesting him; in fact he seemed to gain in

vigor from it and found it increasingly easy to emit the particles of antitoxin as he disposed of the vicious jaws and body.

As he looked about for his next victim, he was surprised to see that the swarms of the enemy had retreated while the Leucocytes around him enjoyed a needed rest. The one next to him turned and said, "I'm glad you're here, Polymorph. You are the first one yet to cope with that toxin. We've all tried, but no one before has found the right combination."

The word was passed from mouth to mouth and all crowded around Leucon congratulating him and asking how he did it. He demonstrated the manner in which he had thrust out and cast off the tiny protuberances that filled and locked the jaws of the toxin molecules and soon all were emitting them. The message traveled and in a short time Leucocytes and phagocytic wall cells in all directions were sending forth streams of the antibodies.

THE respite the invaders gave them was short; they soon came back in increased numbers, charging and biting like beings possessed and ever sending ahead of them the volleys of toxin. This time, however, the antitoxin was ready and each tiny dart was met with an antibody that made for its mouth as unerringly as the toxin molecules made for the cells.

There was something fascinating to Leucon in the way this combat of midgets took place in the midst of their own warfare. A toxin molecule would be discharged and without a moment's hesitation or pause for aim, would dart for the nearest free cell. At the same instant the nearest antibody would fly at its head, never at its tail or body where there was no point of access, and lock itself fast in the gaping jaws effectually blocking them. There seemed some powerful attraction between them and indeed there was, the attraction of an unlinked valence in the atomic structure of the antibody for the opposite electrical charge in the toxin molecule.

Even with the help of the antitoxin, Leucon quickly saw that the fight was far from a sinecure. Relieved of the stinging, paralyzing bites of the toxin, the Leucocytes performed prodigies of destruction, crushing and engulfing hundreds of the foe, but the number of the enemies seemed legion; when one was disposed of, two seemed to take its place, and each new one seemed more active than its predecessors.

Leucon caught one particularly large one by the head and pulled it toward him to engulf it. To his astonishment, it broke in two in the middle and immediately developing head and jaws, swam away, snapping and biting to join its fellows. The organisms were reproducing, not only in their original focus but even at the threshold of conflict.

A little later the cells in the wall of the vein which heretofore had maintained their integrity despite all attacks upon them, began to crumble, and the organisms began to work around the wall of Leucocytes. Leucon followed the impulse that seemed to dominate all of them at the same moment and still fighting, started to retreat down the vein to a new position between healthy walls. They moved a short distance and stood fast, but Leucon had become so distended with organisms that his movements were sluggish and he pushed back from the forefront and gave place to a new and fresh Polymorph. He joined other limping warriors and drifted down the vein where reds were more numerous and the air fresher.

"Too bad about these chaps," gesticulating toward the dead Leucocytes in the channel, "they got theirs before the antitoxin was developed," the Polymorph next to him remarked. Something in the tone of his voice caught Leucon's attention and peering more closely, he recognized his companion of former days, Poli, battle-scarred and worn, to be sure, but none the less his old friend. Tired as he was, he found a real thrill of pleasure in seeing him and he forgot his weariness in his excitement as he rejoined:

"Yes, it's tough, but it was some fight. Do you remember telling me about fighting organisms so long ago? This is my first taste of it, but you were right; it is a Polymorph's career and I'm quite content."

They drifted, as he spoke, to a clean niche in the vein and anchored, side by side as they had in the time long past. Poli looked him over critically and finally recognized him.

"Bless me, if it isn't Leucon, the chap I piloted around when he was only a boy. You've grown, young fellow; you're as large as I am and"—with a rueful grin—"almost as battle-scarred. Well, that is indeed our function in life. We work and fight and we've been lucky; those others we've seen are dead and we are only due for a rest. Let's rest."

Thus, philosophically, Poli dismissed the events of their lives and swinging at ease in the stream, prepared to digest what he had swallowed. Leucon felt inclined to talk and not at all like sleeping, but he followed Poli's example, and together they nodded in the gentle current until the last vestige of all they had engulfed was gone. After a time they awakened, refreshed and prepared to go back to the fight.

THERE was ample evidence that the battle still waged. Débris of cells and tissue floated down and other engorged Leucocytes came from time to time to lick their wounds and regain strength. And as they started back up the stream, Leucon felt the old pull, the chemotaxis (sensitiveness to solutions of chemicals) that had brought him to the scene.

As they worked their way back along the walls of the stream, Leucon asked Poli if he knew who and what the invaders were, confessing, that beyond the fact that they were enemies, he knew nothing of them.

"Why those are bacillus coli, the same as you saw in the intestine," Poli answered. "Only, these have had a chance to become virulent while those others were harmless. That appendix, where the fight is on, has always been a bad spot; we had a skirmish with them there, just before you were born, although it has been quiet lately. You see the mesentery is slightly kinked and anything which shuts off the blood supply lowers the vital resistance of the part and permits the germs to become pathogenic. Bacillus coli is an opportunist; he is a friendly cuss until you give him an opening by lowering the resistance and then he steps in. The toxins from this last outbreak were very severe; we retreated time and again and I'm afraid we will lose much of the appendix. If we do, we will have to wall it off with connective tissue," he grinned as he spoke. "You would turn into a good-looking connective tissue cell."

As they returned toward the scene of conflict, Leucon saw much to support Poli's statement. The flow of toxin molecules had degenerated into a mere trickle and these were all neutralized, but there was a constant seepage of what he instinctively recognized as a juice from necrotic

tissue. The Leucocytes were marshalling in increasing numbers and many of them, instead of working towards the battle, were plastering themselves against the walls and sticking there, while others crawled between and behind the wall cells and settled into place. One, as he watched, began to change color and contract and he saw to his astonishment that the connective tissue cell behind it was *eating* it. The two blended and were one for a moment and then he saw two connective tissue cells in place of one and a Leucocyte. The new one contracted, sealing a point in the wall and slightly narrowing the lumen (opening) of the venule.

FOLLOWING Poli's lead, he paused only a moment, then crawled through a narrow point and squeezed into another line of battle.

The foe, he found, had not lessened in vigor during his absence; they were now without the aid of their toxin, but each individual organism bit and snapped with an enterprise that more than made up for it. Side by side, Leucon and Poli held their place, sometimes even advancing to meet their foes beyond the line. They caught and crushed and swallowed until they were satiated, and still there seemed no let-up. They thrust out a tentacle, caught an enemy by head or tail, drew him in and dispatched him; lashed out with two pseudopods at once and ground a pair together until they ceased struggling; threw themselves on a group and rolled them to death against the wall; as the fight dragged on they tried every imaginable method of offense and still there seemed no end in sight. Leucon looked about for help, but every one seemed busy on his own sector. Suddenly the Leucocyte next to him weakened in his efforts and a score of the enemy threw themselves upon him and tore him to pieces.

Startled, Leucon looked frantically for the reenforcement that should have filled his place, but the hole behind him was tightly closed with connective tissue and he realized with a thrill of horror that they were cut off. Behind him was only a blank wall; before him were necrotic tissue and myriads of enemies. He turned helplessly toward Poli as he had turned for advice so long ago and saw beyond him the last of their fellows being torn to pieces.

A fresh crowd surged upon Poli and instead of his usual dash to meet them, he relaxed beneath their onset. He called weakly to Leucon: "So long, old-timer, it's been a good fight. The fellows behind have walled us off, but they've also walled off the organisms."

He gave a convulsive shudder and was dead; in an instant a score of the foe had torn him into as many pieces.

Leucon mechanically continued to fight, but he felt his own efforts becoming weaker. A lethargy descended upon him and he seemed to view things through a haze. He found time to wonder if this were death and to marvel at its lack of pain; he no longer felt the bites of his enemies, although he dimly realized that he, too, was being torn to pieces.

There came a sheen of something bright and smooth and immeasurably large gliding past him, a flash of blinding light and a voice that could he have understood it, said, "Suture please."

Then there was left of Leucon only a score of pieces carried in as many directions by a host of triumphantly wriggling enemies.

THE nurse rose respectfully from her seat at the chart desk as the surgeon in his operating gown approached.

"How is my patient? Still under ether, I know, but how is his pulse?"

"In good shape? That's fine! Give him my usual routine, liquids as tolerated and morphine, if necessary."

He seated himself and reached for a pen to write the orders upon the chart, then leaned back and stretched his arms.

"That was a nasty appendix, adherent at the tip and necrotic clear to the base, although it was pretty well walled off there. The onset was queer too; the patient says he had a bit of pain ten days ago and absolutely no other complaint until this morning. That," he glanced at his watch, "was just four hours ago. It shows what an apparently normal appendix can do when it decides to become acute.

"Keep an eye on him for a while, he was pretty toxic, although I think he has rallied now.

"I'm due at my office. Good-day."

THE END.

THIS is one of a series of stories by this author, some of which appeared already in AMAZING STORIES. Mr. Alexander has conceived numerous ingenious plans for remedying some seeming irreparable damage, which was more than organic, in that it affected the psychological life of the person to a great extent. In this story he gives us a plausible theory as to where the seat of the dog's uncanny sixth sense might be and the use to which such knowledge might be applied in life. Besides furnishing food for thought, the story is highly entertaining.

The Dog's Sixth Sense

By W. Alexander

Author of: "New Stomachs for Old," "The Fighting Heart," etc.

BEG pardon, sir, Professor Scroggins from the laboratory to see you," said Hawkins, Dr. Wentworth's man, standing just within the library door. "Shall I show him in?"

"Oh, I suppose so, Hawkins," answered the doctor with a regretful sigh, placing his magazine on the table, "but I might almost as well be married if my evenings are to be disturbed in this way."

"Ah, good-evening, Professor," he greeted his visitor a moment later. "Nothing wrong at the laboratory I trust?"

"No, not at all, Doctor," assured Professor Scroggins, an unkempt little man with a fiery red Van Dyke beard, peering intently at the doctor through huge thick-lensed glasses. "It is only that I must talk to you about my experiments with dogs' eyes. I tried to talk to you about the matter many times—whenever you drop in at the laboratory, in fact—but you are always in such a hurry that I can not get your attention."

"Very well, Professor," said Dr. Wentworth, smiling kindly at the nervous little man moving restlessly about the room, "you have me cornered now, so tell me what is on your mind. But as I told you before, when you mentioned the experiments on which you were working, I think the idea is absolutely crazy."

"The idea is new, but not crazy," protested Scroggins vehemently. "Years ago you would have said the same of the X-ray, the radio and grafting an animal's eye into the empty socket in a man's head, and thereby restoring his vision. Today we take those things as a matter of course and you think nothing at all of grafting a pig's eye into a man's head, who has lost an eye, and so restoring his sight."

"There is some truth in what you say," conceded the doctor thoughtfully. "Everything in science that was radical, seemed crazy when it was first suggested. Explain to me what you have accomplished in your experiments and what you wish of me."

"You are now using the eyes from pigs, which I prepare for you in the laboratory, in your restoration of sight operation. In your next operation, I would like you to use a dog's eye, that I will prepare for you. When laid on the table side by side, you can't tell the two eyes apart, but my theory is, that an eye from a highly trained dog, when properly grafted into the empty socket in a man's head, will not only give that man vision—as does the pig's eye which you are now using—but will give him the power to read another person's thoughts.

"I have proved to my complete satisfaction that a well-trained dog can, to some extent, read a person's thoughts. Men who have made a life-long study of dogs all agree to this. A notable example is Terhune with his collies. He gives instance after instance, in proof that his dogs do read his thoughts.

"I contend then, that if you put a dog's eye in a man's head, it will become many times more efficient at reading thoughts, when backed by the man's superior intelligence."

"Your contention is plausible," remarked the doctor after a moment's thought, "but I should want to do some work with you in the laboratory before attempting the operation. You see, in my use of pigs' eyes in my operations, I am merely following the discoveries made by the French surgeon, Dr. Perriot. When I attended his clinic, he informed me that he had experimented with the eyes of a great many different animals, and had found that the eyes of pigs were best adapted to grafting to the human being. I promise you, Professor, that as soon as I can find the time, I will work with you in the laboratory on the possibility of grafting a dog's eye to a man. If we find it possible, I will use it in an operation and ascertain if it does make the person a thought-reader, as you surmise."

"Well, I suppose I will have to wait until you are ready," said Professor Scroggins regretfully, as he prepared to leave. "I can do no more with my experiments. It is you only that has the skill to graft the eye in a human head. But mark my words, the dog has a sixth sense, call it thought-reading or what you may, that I believe comes to him through his eyes. This faculty will be greatly enhanced when aided by a man's brain."

THE first man to be ushered into Dr. Wentworth's office on the following morning was a clean-cut, well-built young man, who introduced himself as Lewis Brunston, private detective. He wore a green patch over one eye, held in place by a bit of elastic, which encircled his head.

"I lost my eye a short time ago, Doctor," he said, "while trying to arrest a gang of box-car thieves. I have heard rumors of a wonderful operation that you are performing, restoring sight by placing an artificial eye in the empty socket. Has some one been stringing me, or is it true?"

"Perfectly true," assured the doctor, "I have per-

Illustration by Briggs

¶ *In moments of leisure, the scientist stares at the thought-reading eye, which rests in a tank of alcohol.*

formed a number of such operations within the last year and all were successful in restoring the vision. Let me examine your eye-socket."

After a careful examination, the doctor informed him that the optic nerve was unimpaired and that sight could be restored.

"It does seem impossible," exclaimed Brunston incredulously, "that you can restore a man's sight by sticking in a glass eye."

"But we do not use glass eyes," explained Dr. Wentworth. "We use an eye from a pig. By subjecting it to a certain treatment, we can keep it in perfect condition, tissues alive though dormant, until we are ready to use it, even after as long an interval as three months.

"Before the pig's eye is placed in your empty socket, the back is coated thickly with Doctor Zambi's famous collodiansy, this causes a perfect fuse or graft between your nerves, muscles, veins and arteries, and those of the new eye. Even your optic nerve becomes firmly fused to the optic nerve in the pig's eye. Gradually blood commences to circulate through the new eye and when circulation reaches normal, sight is restored."

"That sounds marvelous," exclaimed Brunston enthusiastically. "How soon can you operate on me? A man in the detective business needs two eyes, plus."

"You may arrange to enter the hospital to-morrow. It will be ten days before you will be ready to leave."

The operation was successfully performed and two weeks later Lewis Brunston was again in his office, ready for business. Up to this time he had made no great success as a detective. In fact, it would have been difficult for him to pay for Dr. Wentworth's operation had it not been for an accident insurance policy that he carried, which paid him five thousand dollars for the loss of his eye.

A few weeks after he had resumed business, it commenced to grow in leaps and bounds. He soon gained a reputation in the city for never failing to solve a mystery. Then his fame spread over the state and in the course of six months he had gained a national reputation as a solver of mysteries. He was called to all parts of the country in difficult cases, and while his fees were high, no mystery remained a mystery, when he had finished with a case. He became front page news for the papers and was lauded as a far greater detective than Conan Doyle's mythical Sherlock Holmes.

IT was just a little over a year after the operation that Lewis Brunston called at Dr. Wentworth's home, quite late one night.

"How are you Mr. Brunston?" asked the doctor, shaking hands with him cordially. "I don't think that I have seen you since I performed the operation for restoring the sight of your left eye. But I often see your name in the paper, as you have become a national character."

"Yes, yes, Doctor," replied Brunston gloomily, drawing nervously on his cigarette. "I have done well enough in business, made a fortune in fact, but I am the most miserable man in the world."

"Miserable?" questioned the doctor in surprise. "That is odd, I should suppose that you would be a very happy man. You are an outstanding success in your profession, and have made a fortune very quickly."

"That's all well enough, but why did you not warn me as to the kind of eye I was getting—though at that, it would probably have done no good."

"Just what do you mean, sir?" demanded Dr. Wentworth, somewhat nettled at the man's tone and manner. "I took great care to explain to you in detail, the nature of the operation and what the result would be."

"Quite true, you did," Brunston replied sharply, "but you failed to inform me that the eye I was acquiring would enable me to read a person's thoughts."

"You are crazy, man," exclaimed the doctor hotly, looking at him with growing suspicion and sniffing the air for an odor of liquor. "That pig's eye is no mind reader."

"Pig's eye or cow's eye, it sure is," replied Brunston positively, "and it improves with use, because I can read thoughts now much more easily than at first. Just you sit there and think a few thoughts and I'll read them for you." He took a handkerchief from his pocket and held it lightly over his right eye, staring intently at the doctor with the acquired left eye. "You are thinking that I am drunk, or have been taking dope. Now you are thinking of some conversation you had with Scroggins. Now you are wondering if he slipped something over on you."

"Wonderful," muttered the doctor in astonishment. "I believe you now and I can guess what happened. Just before your operation, Professor Scroggins, then the head of my laboratory, tried to interest me in using dogs' eyes instead of pigs' eyes. He believed that a person equipped with a dog's eye could read another person's thoughts, just as a dog, to some extent, can read his master's mind. He believed this faculty would be very much increased in the man, because, it would be backed by the human brain and intelligence. I promised to look into the matter later, when I found the time.

"I am now convinced, that when he sent up the eye I was to use in your operation, he sent me a dog's eye instead of a pig's eye. Just after your operation he had a stroke of apoplexy and before he died he tried to tell me something about an eye, but a second stroke killed him before I could understand what he was trying to tell me. After his death, on invoicing the laboratory, we found on hand one more eye than could be accounted for."

"Well it is a wonderful eye," said Brunston gravely. "With it I can now read thoughts as easily as you read the newspaper, and it has made me a fortune. The faculty of reading thoughts was what established my reputation as an infallible solver of mysteries. But I don't want it for it has turned me away from my wife and all of my friends. I am now convinced that it is the prerogative of the Supreme Being only, to read the thoughts of men."

"How in the world did you discover its power to read thoughts?" asked the doctor with keen interest.

"It was quite by accident," answered Brunston. "About three weeks after my operation, the president of a local bank called me in, ostensibly to help them solve the mystery of the disappearance of fifty thousand dollars in currency from the bank.

"Sitting in his office while he explained the case, I was annoyed by gnats flying in through the open window. They buzzed about my face and one finally flew into my right eye. I wiped it out with my handkerchief, but as my eye continued to burn, I held my handkerchief over it, at the same time concentrating my attention on the president's explanation.

"As I watched him with my left eye, I suddenly be-

came aware that I knew just what he was going to say, before he spoke. It was something like listening to one of those slow speaking people—you know what they are going to say and can hardly resist the temptation to say it quickly for them.

"WHEN he finished telling me the details of the case, I asked for a few minutes to study it over, and sat—as he supposed—buried in deep thought. Actually I was watching him closely with my left eye. I could hardly repress my astonishment at the thoughts I read passing through his mind. 'I have this dumb detective fooled nicely.' So his thoughts ran, 'Wouldn't he be surprised if he knew that the fifty thousand was tucked away in my private safe at home.'

"After a moment I said: 'Mr. President, I am a fast worker in simple cases such as this. My fee is ten thousand dollars, which I will take now, and at three this afternoon I will give you the solution of the mystery, find the money, or return my fee.'

"He demurred for a time, but finally gave me a certified check, his thoughts reading that he was only lending me the check until the afternoon.

"When I met him at three o'clock, I forced him to return the money, sell his stock in the bank to the vice-president and resign his position as president and director. I allowed him to tell the directors a fairy tale to save his face.

"That was the beginning of my career as a solver of mysteries. However, I could not confine my thought-reading to business. In chatting with a friend, I would frequently cover my right eye for a moment and so read his thoughts. Sometimes those thoughts were uncomplimentary to myself, and my friendship would turn to dislike and a friend was lost to me. I am fond of a social game of poker, but could not resist the temptation to read the thoughts of the other players and so learn what cards they held, when the play was close and the pot was big. I won so consistently that my acquaintances soon looked on me with suspicion and ceased to invite me to join their games.

"One night, after a tiff with my wife over some very trivial matter, I read her thoughts and what I read turned my love to aversion. And so my wife was lost to me.

"Believe me, Dr. Wentworth," concluded Brunston with deep emotion, "no man can read the thoughts of others and long keep his sanity. If the ability became common, we would soon become again the snarling, suspicious beasts of our cave-man days. No woman's virtue would be safe, for at times we would read in her thoughts that, which it is not well for a man to know. Man's honor would be unsafe, for at times, under stress, his thoughts would reveal its price. Reading the thoughts of others will make a quick fortune, true, but the world will become too foul to live in. Please take back this eye, that I may forget the thoughts I have read."

"That is the most remarkable tale I have ever heard," said Dr. Wentworth, with the enthusiasm of the scientist which he was. "What a pity that poor Scroggins did not live to hear it. Enter the hospital to-morrow and I will perform another operation, relieving you of this obnoxious eye, and replacing it with a pig's eye, such as we have always used."

Lewis Brunston's thought-reading eye now rests in a tank of alcohol on Dr. Wentworth's desk, and in moments of leisure the scientist stares at it, picturing its immense possibilities.

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 textbook. 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 action of bacteria in the human system? (See page 535.)
2. What is chemotaxis? (See page 538.)
3. What is the Kelvin balance? (See page 516.)
4. What is a tesseract? (See page 518.)
5. What is a pseudopod? (See page 528.)
6. What is the coloring matter of the blood and its name? (See page 531.)
7. Does the food you eat pass inside or outside of your body? (See page 531.)
8. What is the largest vein in the body? (See page 532.)
9. What organ forms sugar in the blood? (See page 532.)
10. How often does the blood of a human being go through the lungs? (See page 532.)
11. What change of gases are the red blood corpuscles (erythrocytes) subjected to and what is the effect on their color? (See page 533.)
12. What is the function of hormones? (See page 533.)
13. Do men walking on the earth attract it? (See page 569.)
14. What do the limitations of motion appear to be by the Lorentz-Fitzgerald equation? (See page 575.)

Concluding Our New Interplanetary Serial

Out of the Void

By Leslie F. Stone

Part II

What Went Before

ON his way to a week-end shack in the woods near a fishing stream, the narrator of this story is arrested by the gleam of glass, which shines through the trees. On entering the shack, he finds his camp clothes are gone and that a ruby of astonishing beauty has been left, apparently to replace it. He goes out to investigate, remembers the gleam of glass, and follows that trail.

He reaches an open glade in the woods, where a giant construction of torpedo design is reposing. Close inspection and careful investigation fail to disclose what it is. Chagrined, he starts toward the village for help, but is halted by an unearthly shriek and is captured and dragged into this strange structure, almost before he can recover from his astonishment. During the process of capture he suffers a broken collar bone and all becomes oblivion. When he regains consciousness, he sees a giant man of silver skin and lavender eyes bending over him. He learns he is a captive in the Yodverl, *a ship from Abrui, a planet beyond the Void, come to earth to deliver a message to Professor Ezra Rollins, a scientist, who had many years before sent Dana Gleason, supposed by the world to be a brave and adventure-loving young man, on an experimental trip to Mars, in a rocket ship of his own construction.*

Only Richard Dorr, an engineer and friend of the professor, and his daughter, Elsie, know that Dana Gleason was a woman and was in love with her. Just as the rocket ship was ready to clear its moorings and shoot off into space, Dorr made his way in, unnoticed. It was too late to put him out when Dana discovers him.

And now Sa-Dak, the silver visitor from Abrui, a planetoid many thousand miles beyond Mars, goes to Africa with the Yodverl *and tells the professor, when they arrive at his home there, of his mission. He tells of the almost disastrous landing of the rocket ship on Abrui and hands the professor a diary in which Dana Gleason has recorded faithfully her experiences of the trip into and through the Void, practically to the time of the landing.*

Elsie Rollins is reading the contents of the diary aloud.

Illustrations by Hugh McKay

An Awakening

WHEN we knew at last that Mars was not for us, that the hoary old fellow was laughing at us, something seemed to break within me. I experienced dizziness, a faintness, a blackness, and a desire to cry. I, Dana Gleason! I reeled and would have fallen if Dick, dear Dick, had not caught me and carried me back to our living quarters and laid me gently on the couch. For what seemed hours he cradled me in his arms. Was ever a man kinder, gentler? And then . . . he kissed me, Dana Gleason, who had never been kissed!

"'Dana,' he was whispering, 'we have lost, it is true, but did we not undertake to leave Earth behind? A little less time to live, but a longer time to learn the meaning of eternity. You have been brave, wonderfully brave. Is this the time to forget your courage?' He said more and more, that I scarcely heard. Something new was creeping into me, a strange warmness that I had never known. What was it? Was it this newly realized womanhood that was grasping me?

"A new life was flowing into my body. 'Dana, Dana,' he whispered, as if anyone else could hear, 'How I love you. I loved you before I knew you were a woman, and I have adored you more each day. True I have suffered every day that I was so near you and could not tell you. Always I forced myself to act the rôle of a friend. I did not dream that it would come this way. . . . I thought that on this other world we should find love together, in the need for each other, work together, live for each other. Instead, God is giving us Death. . . .'

"Tears stood in his eyes, and now it was I who must

¶ *The walls of the cabin were of glass and above her sounded the beat of wings.*

give comfort. Was there not at least a year? Our provisions safely guarded would last even longer. At least we had each other. Each other, how sweet that sounds. For hours we did not move, scarcely talking, sitting there, delighting in each other. We fell asleep there with arms intertwined, and the majesty of Mars passed us by.

"Dick was the first to awaken, and I opened to the sound of his whistle from the bathroom as he bathed and shaved. I had heard him do the same thing every morning aboard the rocket, but this morning it all sounded so different. It made me indescribably happy. Then he came forth, fresh and glowing, and took me in his arms again.

"As I performed my ablutions I heard him in the kitchen with the coffee percolator, and I hurried to help him prepare breakfast. There were two oranges left and some eggs in a wax jacket. We made bread from our supplies, and for the rest we were now eating chemically compounded pellets that are as nourishing as meats, vegetables, and fruits, except that they do not satisfy the taste. There is still a whole case of chocolates and the wherewithal to make other sweets, when that supply gives out.

"Never have I eaten a happier meal than that breakfast. It was as if I had never eaten before, and there would be at least 365 more of such breakfasts. Beyond that we do not try to think. We have begun to live, why think of dying? Imagine happiness aboard a rocket traveling farther and farther into the space where time is an unreckoned quantity, and age is ageless. Was there ever a like honeymoon?

"We climbed again to the look-out. There was Mars, immense, serene and out of our reach. We turned away with little concern. I hate to think of what might have been had not Dick climbed into the rocket at the very last moment. We laugh to think that I tried to put him out.

" 'I'll admit that I lied to you in saying I came in the interests of Professor Rollins. No man could be that great. I feared I would lose you irrevocably if I told you the truth.'

" 'I can't imagine how you learned that I was a woman. I was so careful. Dad taught me that, even to lathering my face each morning and running a bladeless razor over my face!'

"How he laughed at that. 'Well, do you recall the little pool set in a circlet of trees about four miles from the bungalow where you so often went for a swim? Incidentally, that was a favorite nook of mine. You startled me one day from a revery when you came, thinking there was no one within several miles of you. Before I could announce myself you had undressed and were swimming in the pool. I crept away without your knowing I was there at all!'

" 'I was astonished, but then I felt I had always known. I could not guess why you were masquerading this way. Of course, I knew your reputation and knew that you had always lived as a boy. At first I thought you were intentionally duping the Professor for some ulterior motive, or perhaps in the interest of others. I hated you then, and I dreaded the moment you would disclose the truth to him. Then when I knew that you really were going through with this I was at my wit's end. I could not break the Professor's heart by telling him, nor could I let you go alone. So, in part, I was truthful in saying that it was for Rollins' interest. That is all, Dana. . . .'

Breaking the Speed Laws!

"MANY, many hours, days, and nights, as we figure time on Earth, have passed and faster and faster we are making our way across the Void. We have passed Jupiter and his bright glow is intense. Far ahead and thousands upon thousands of miles to the right we can see Saturn with his numerous satellites and rings. Old Sol grows more distant, less brilliant. The blackness appears blacker. Yet we care naught for any of this. Science has succumbed to Love and we, mites in a cheese box, are living hour for hour, a whole lifetime to be lived in a day!

"We do not count time. Everything now is in the present. We do not rewind the clock. It is too cruel a reminder. We eat, sleep and live only according to desire."

LATER:

"We have passed the distant planet Uranus. Our Universe lies behind. Before us stretches the inconceivable waste that lies between the solar system and its nearest neighbor millions upon millions of miles away. It is black, inconceivably black. There is only a glow of the great world across this sea of nothingness, and of Worlds and Universes that are more immense than that which we leave behind. Looking at the meters for the first time in many days, we discover that we are now traveling at an incredible rate of speed, nearly as fast now as light itself. And science tells us that it takes many years for light to travel from the nearest stars! And we have only a year to live!"

LATER:

"We are wrong! Life is not for us. The God of the Immensity has declared himself. After realizing that we were out of the Universe we did not return to the lookout for over twenty-four hours. We found then that the glass was becoming smoky, so smoky that we could not even see the stars. That can mean only one thing. The smooth shell of our rocket is burning. Friction in a vacuum! It seems impossible, but what else could it be? Friction is wearing away the steel of our smooth coat. How long ere it will burn through? Can the shell of our sealed living chambers withstand that? No, we are not even to have the sanctuary of a coffin. We are to be belched out into Space to fall forever with sightless eyes before the awful grandeur. God is revengeful!

"After our discovery Dick and I sat staring at each other with hands interclasped for long hours. 'It is the end,' we whispered together. 'How happy we have been!'

" 'How long can we last?'

" 'Only God knows that.'

" 'Must we wait?' I hated to picture what the end would be. 'Can't we go together with arms around each other?'

"What to do?

"In answer I pulled out the small automatic that I had carried with me since childhood. I saw the glow come into Dick's blue eyes. He caught me by the shoulders and looked into my eyes. 'You are brave, Dana Gleason.'

" 'Only a coward,' I answered. 'We will wait until we see that all is lost. A few hours still remain to us.' "

ELSIE ROLLINS looked up from the diary. "That is all, the book ends here." She turned to the last page of the book and sat staring at it lying in her hands.

Landing on Abrui

THE Professor had been drinking in every word. "And, what happened? It must have taken a miracle to save them!"

Our host, who had been listening with half-closed eyes, looked up. "What happened, the two lovers could not guess, trapped as they were in the rocket. It was a miracle that saved them. For beyond Uranus there lies Abrui, a small planet that has never been discovered by earthly astronomers and follows somewhat the path taken by Uranus. It was this planet that reached out and drew the rocket into its orbit.

"They thought that Space had set their vehicle on fire, but nothing burns out there. In truth they were circling our planet. Their belief that they were traveling as fast as light was probably incorrect. The meters lied; due perhaps to the attraction of the planet, their velocity had decreased rather than increased.

"Abrui's gravity was slowly drawing the rocket within a narrowing circle until men of the planet saw it in their sky. Every hour brought it closer, and the whole world stared in wonder. Astronomers watched and surmised. Heretofore, meteorites had fallen without number on our globe, but never had a meteor acted in such a fashion. By day it shimmered and at night it glowed, for it had, of course, become red hot as soon as it entered our atmosphere, driving at such high speed.

"Lower and lower it came, and then it was evident that in another day it would fall. It was Moura-weit who was the first to realize that this was no stray skyrocket, but in truth a man-made thing, born of some other world. The conjectures were many. However, it was Moura-weit and Ubca-tor, his companion, who followed the course of the rocket in their flyer, to arrive at its landing. Moura-weit was the only one who conceived the thought that men were riding in that red hot thing.

"So these two men came to see the landing. Fate steered toward a wild section of the globe, an arid, infertile place inhabited only by barbarians. It fell with a horrible cacophony of sound, exploding in mid-air and burying half its length in the unprofitable soil of the plain.

"Moura-weit had wisely kept his plane at a good distance from the rocket, and he and Ubca-tor exclaimed at the beauty and horror of that tremendous fall. They saw debris flying off in every direction; for after the first explosion there came another and another until like a giant firecracker it was popping and cracking wildly. It was Ubca that saw the thing that looked like a body, limp and lifeless, coming toward them.

"In the great fall of the rocket both of them marveled at the majesty of the breaking up. It could be seen that in falling every piece of debris settled slowly, the larger pieces dropping more rapidly, the smaller following with more deliberation, as a stone that is thrown in a pool of thick mud slowly sinks out of sight, the thick liquid buoying it up until by its own weight it sinks. Abrui being somewhat smaller than Earth has not as great a power of gravity, and consequently the Earth-things were of less weight.

"And since the body of Dana Gleason was lighter in comparison to those great pieces of steel, her fall was even slower and more gentle. She fell to the ground like a bit of fluff, scarcely sustaining a jar.

"As soon as the two men descried the human body they were after it and Ubca jumped from the flyer before it touched the ground. Carefully he lifted the lifeless body and returned with it to his companion. Sharply the plane arose, for there was still falling debris; the explosions of the twisted racked structure had not ceased.

"They laid the body on a couch in the enclosed cabin and Ubca took control of the flyer so that Moura, who was acquainted with the art of medicine, might examine her to see if life still remained. He felt the faint beat of the heart, and taking a phial from his pocket, forced a drop of its contents between her lips. That action was greeted with convulsions at first, then the patient commenced to take deep breaths, and from the moaning it was apparent that she suffered at every gasp. Moura had already discovered that the rocket's passenger was a woman.

"From her lips there came a sound. 'Dick!' the lips formed. Immediately Moura-weit turned to his companion. 'Quick, circle about. There was a second passenger!"

"By this time the air was practically clear of falling debris, except for a few lighter objects that sank slowly to the ground circling and twirling. The great mass of iron and steel lay on the ground glowing and smoking. Ubca directed the plane close to the ground. He was suddenly aware of shapes taking form some hundred yards away. They were the barbarians that had been encamped not far away. Recovering from their fright they were now slowly approaching the ruin to puzzle out what had fallen. Ubca saw a second body lying on the ground. The nearest barbarian was five or six hundred yards away. The plane touched the ground while Moura took control. Kneeling beside the unconscious man, Ubca turned him over. In the red glare from the wreck he saw the face and with an exclamation of disgust he rose to his feet and scurried back.

"It's naught but a Goran* he declared.

"Circling about another few minutes they could discover nothing else. By this time the barbarians were coming in full force. Their eyes turned to the flyer and their weapons were unslung. They found the man Ubca had disdained.

"Moura-weit was confident now that if there was another passenger in the rocket with the woman, he had died in the flames. He did not know that Ubca had mistaken the reddish hair and tanned skin of Richard Dorr for one of the barbarians, whose skin is likewise bronze. Turning the plane about, they headed for Carajama, the capital of their own country."

"So came Dana Gleason and Richard Dorr to Abrui, my friends." Our host smiled down upon us. During this narration he had been pacing back and forth before us.

"Surely, you are going to tell us more?" demanded the Professor.

"It grows late, sir. Already the sky is becoming light!" he protested.

"What does that matter? I insist that you tell us all."

*The race of Gora, considered barbarians, whose skin and hair is bronze-like.

The Story of Sa-Dak

THE other shrugged his shoulders. "It will delay our departure, but since you wish it, sir . . . First, however, I should suggest a swim in the pool to refresh us, and a bit to eat and drink."

Rollins said he did not swim, but the bath would be welcome. Miss Rollins was delighted. I was declared unfit for swimming because of my shoulder, yet I would be allowed to take a dip. The golden slave appeared without a summons and escorted us to the various bedrooms. Swimming-suits were brought. These consisted of one-piece affairs of a strange white material that was silky to the touch and as heavy as jersey. The trunks reached half-way down the thigh, and the neck and arm holes were cut low. The slave aided me in undressing, and insisted upon rubbing my shoulder again with his salve.

Neither the thin frame of the professor, nor my own, already inclined to corpulency, cut a very fine figure, but the sight of the two silver men held the eye. Never have I seen two finer-looking men, both over six feet tall and with the smooth, flowing muscles of highly developed bodies. Both wore no more than short trunks. Miss Rollins looked pretty in her suit.

Rollins and I descended into the pool by way of a flight of steps, but the other three dived off the side of the pool into the deep water. They had a race. The stroke used by the silver men was strange. It mostly resembled the breast-stroke, except that it was more "frog-fashion," both propelled the body through the water by jerks, hands and feet moving in unison in one great effort; and each stroke carried the men almost twice their length through the water. Naturally enough, Miss Rollins, with her pretty side-stroke, was left a considerable distance behind.

They joined us; and as the two men stood beside us I saw that the water ran from their broad chests and shoulders without seeming to wet them. "That," said Sa-Dak reading my thought, "is due to the oil with which we polish our bodies. It is a matter of pride to keep our bodies highly polished. The bronze man who neglects this vanity is not a pretty fellow with his dull ochre body. We have a saying that 'a well-oiled body gives evidence of a well-ordered mind.' And the poorest of men oils his body."

Our bath finished, we returned to the dressing-rooms and were given great towels that were very absorbent. I noted how well I felt, how my body glowed, and how the spirit of well-being pervaded me. Later, we were informed that a small quantity of a solution of radium in the water produced these effects. My shoulder seemed completely healed, so that I was never to feel more discomfort from it.

In the atoll we found food awaiting us on small tables set beside our couches. There was a fresh fruit that had the taste of both apple and peach and looked like a melon, some sort of cooked meal, and a hot beverage that had the taste of many flowers. After eating, we settled ourselves on our couches once more to hear what remained to be told of the story of Dana Gleason and Richard Dorr.

"I am telling this in the third person," began our host, "to avoid any unnecessary personal references, and for easier sequence. Perhaps first I had better explain a little about the planet, its peoples, its geography, its history."

The Narrative

ON Abrui there are three races. The Tabora, who hold in their grasp the single ocean of the planet, and esteem themselves the only civilized people of the planet, though once they were barbarians occupying the "backlands," into which they drove the Gora, the simple-minded. From the Moata, a more ancient race than themselves, they got their culture, their science and their social codes, subjugating these people to their will and enslaving them.

The Tabora is the silver man of Abrui, a fine upstanding man, taller in stature than men of the other races, with well-formed features and a quick, ready, clear-thinking mind. The Moata are golden, smaller than their masters, weaker, and with fear bred in their minds. The Gora is the barbarian, made so by circumstances. He is bronze-colored, bronze-skinned, bronze-haired, and brown-eyed. He is not quite so tall as the Tabora, but he has a stockier, more powerful body; is fearless, though superstitious, and his imagination peoples his country with hobgoblins and god-things. He has little science, since all his days are spent in forcing his barren plains and swamps and deserts to yield him a livelihood.

Moura-weit and Ubca-tor were of the Tabora. They were Doatans, and Doata is the most powerful of the three nations of Tabora. Of Tabora there are the three countries, Doata, Zoada, and Loata, all bordering on the one ocean, Sehti. Sehti covers a little more than a third of the planet. Rich, fertile plains border the sea; and beyond the plains are the great mountains, Hopli, which almost entirely encircle the ocean and are the backbone of Tabora, separating one fertile plain from another. Deserts, swamps, wide rivers, all help to separate Gora from Tabora. Tabora has thousands of cities on the broad plains, in the rolling tablelands and foothills, and in the mountains themselves, which are not overly high but are great irregular chains.

In the ocean, Sehti, lies Ora, a large island, with a few smaller ones near it. Ora is the seat of all learning; it existed in the day of the Moata. Here any man or woman is welcome to study, to forward science, to teach. Ora belongs to no nation, having a government of its own. It is a place of refuge for the exile, the outcast. Once within its bounds, the malefactor is safe and can in no way be extradited.

To the south of the ocean lies Zoada, extending over a thousand miles from east to west and several thousand miles to the low-lying swamps that separate her from Gora. Beyond her boundaries is the ice cap of the Southern magnetic pole. To the west of her lies Loata. Loata's west coast fronts all of the eastern shore of the ocean, and extends over a great part of the northern coast besides.

One might wonder how Abrui, which lies so far from the Sun as to have a solar year of 365 earthly years, can be inhabited. The answer is simple; for, whereas all her sister planets depend solely upon the common sun for their heat and light, Abrui is fortunate enough to have a sun of her own. Dana Gleason is certain that on Earth astronomers have never conceived the possibility of a planet possessing a sun of its own in the same manner as Abrui possesses one, although the phenomena of twin suns encircling each other, as well as triple suns, have been observed. Taboran astronomers have observed many planets with satellite suns exactly like Abrui's companion.

Still the satellite sun is no rival of Sol, so called by Earth people, but named Coe by Abruians. Tradr, the second sun, gives off a warm, rosy-pink glow; unlike Sol it does not send out sharp rays but shines more like the glow from a lamp, so that it is possible to look directly at the satellite without discomfort. It is believed that once Tradr was nothing more than a moon shining only by reflected light. Then the planet must have been cold, unable to foster life in the poor warmth from the distant sun. However, something warmed the moon's core so that its center seethed as a furnace; and gradually the heat penetrated the whole shell, turning its solids into gases. Many theories have been brought forth from Ora concerning the reason of this strange occurrence of a sphere, once dead, coming to life. The most prevalent and the most generally believed theory is that on Tradr is a vast quantity of the element, radium. They understand the power of this element; and it is certain that its presence accounts for the "catching afire" of the satellite.

Tradr, therefore, controls the day of Abrui, and it encircles the entire globe in a little less than thirty hours; while the planet, which turns slowly on its axis, has a solar day of almost one hundred hours. Sol, therefore, is like unto a moon to Abrui in the nights when it still lingers in the heavens; while the planet depends entirely upon its satellites for both heat and light.

Tradr never alters its course; it gives an even heat, day after day, with no change of climate year in and year out, a pleasant warmth; and, except at the southern pole, extreme cold is unknown. It is toward the northern pole that Sol directs his rays, and the warmth is enough to keep that part of the globe from freezing.

The planetary year is naturally reckoned according to the phases of the satellite sun, counting ten phases to a year. A phase is of twenty-two days, while the length of each day is thirty hours.

A Visitor from the Void

IT was night when the earth rocket dropped into the unfruitful land of the Gora. Sol had been hidden for many hours behind clouds, but now he was drawing himself out of the blanket. In size he looked not as large as an orange, and the light that came from him was silvery. All about him were myriads of stars that tried to rival his splendor, great brilliant stars that twinkled and winked and refused to be extinguished in the light that Sol shed about him.

Moura-weit and Ubca-tor had no time for the light of the sun. They were busy with their patient, trying to bring her to consciousness; yet she seemed fighting them. This bothered the two men. "She is seeking for the other one who accompanied her on her journey," observed Moura. "Were it not for those ropts (rodent-like creatures)* we could search for the remains of the other traveler; for, no doubt, he was caught within that débris. Were the Gors to find him they would only kill him, thinking him a demon or whatnot. Well, at least we have this one."

Ubca said nothing, his eyes fastened on the strange being in her queer clothing. He had come on this adventure because Moura-weit had so directed. He was no more than a boy, who had taken Moura-weit as his hero and who followed blindly wherever the other might lead. He was a younger son of the brother of Kirada Walti (king of Doata), as the suffix *tor*, added to his name, implied. And as Moura was merely of the Weita, the lowest rank of Taboran nobility, it was surprising to find the boy in his train. However, Moura-weit was not a common man. He was ambitious.

Already it was whispered that Moura-weit had attained enviable power behind the throne of Doata. He was beloved of the masses for it, and hated by his superiors—the nobility. Abrui is not unlike Earth. It has its kings to rule, its common people to rave and rant and dictate, its slaves to suffer. And Moura-weit's ambition was to be a dictator not only to Doata but also to Zoada and Loata.

Moura-weit's social rank can be compared to that of the English baronet. People declared that this Moura was not born of woman as are all men but of the Unkonatas, a group of scientists, who years before taught that the foundation of life was not flesh but mind. It was said that they had produced a child by means of thought with the aid of a woman. Their next step was to bring forth a child without woman's help. The Wukonuals, a second group, who were materialists, preached against the Unkonatas, calling them traitors to the State. Consequently the sect was sought out, many were killed and the rest dispersed. What happened to the child, if there was a child, was not known; but the masses liked to believe that the Unkonatas, on dying, had bequeathed to the child their brains, so that the child, should he grow to manhood, would possess their collective consciousness entire. And it was said that Moura-weit was that child!

Moura-weit liked to foster that thought. True, he had a great mind; none could best him in any line of endeavor. His oratory, his science, abstract and concrete thought, his knowledge of divers things, his understanding of all that went on in the world, marked him as a man apart. Nothing that he set himself to do was left undone, either in art, mechanics, science, or athletics. And it was always he who did it best.

ON Abrui man has learned more about the brain than he has on Earth. He has solved the secret of thought transference from mind to mind. And in a world that finds it a common thing to know another's thought, Moura-weit surpassed them all. He not only read his fellow man's thoughts, his secrets, his desires, he followed the train of thought of the thinker and knew what his next move would be ere that man himself knew it. And no man could close his mind to his penetrating gaze. He could know what a man separated from him by a wall was thinking. Consequently he was feared by those who hated him; and while many would willingly have done away with this man of power, they dreaded his prying brain, knowing that Moura-weit would forestall any attempt made on his life.

And it was this man alone who knew that there was a living person in the rocket that came swimming into the atmospheric belt of Abrui. So it was he who was thereafter to have Dana Gleason in his keeping.

His attention was now focused on the woman. Her breath was still coming in gasps, due to a slight difference in the atmosphere of this planet from that of her own. Soon, however, her breathing became easier as her lungs adjusted themselves to the change. Moura-weit studied her strange covering, her coloring, her appearance, her strange mind.

*Gorans.

Dana Gleason knew nothing of mental telepathy, though she had heard its theory expounded on earth; she knew nothing of closing her brain, even had she been conscious of the fact that Moura-weit was searching out its nooks and corners. She was at that moment living over again all that had passed in the last two months. Many nightmarish dreams swept across and clouded out the actual memories from time to time, but the man knew how to differentiate between the two.

Recurring time and time again, he saw the figure of a man, a figure that at first had puzzled Moura, for the complexion of the figure seemed to Moura to be that of a bronze Gora. Then, as the figure became clearer to him, he realized that the tall, handsome man was not an inhabitant of Abrui; that he had neither the squatness of the Gora nor the broad face and features of the barbarians; his eyes, too, were the color of the sky, while Goran eyes were brown.

Covertly Moura flashed a look at Ubca. Had he seen anything of this? Did he read Moura-weit's mind? But no; his eyes were on the quiet figure on the couch, his thoughts were elsewhere. So Moura kept his own counsel. He might then have told Ubca that the man he had found and thought to be a Gora was in truth the companion traveler of Dana Gleason, but he said nothing of that. Had he told him, the train of events might have turned out differently.

Moura-weit had not as yet shaped his plans. He realized that he had indeed a find. Doata and Ora would do him honor when he brought the news of this voyage from Out of the Void. Science would be forwarded. And Moura would prosper.

Ubca-tor broke the line of his thoughts. "What planet could this creature have come from, Moura? They must have progressed far, to be able to send a vehicle through Space. And to send a woman!"

"Yes, the planet must be far advanced. Yet it must be one of the four planets upon which our observatories have discovered life, one of the four planets that lie close to the Great Sun. The other four we know to be either too hot or too cold to sustain life. It was a long journey to make! And it is indeed lucky that we discovered this woman in time. If she had a companion, as I believe she had, he must surely have perished in the flames of the exploding machine. But, it will be a great day for Ora when we take her thither!"

"Surely you will take her to Doata first?" said the boy.

"Naturally to Carajama first! Are we not Doatans?"

Moura had really been wondering which would be the best course—to take the woman first to Doata or to Ora. He knew that by presenting her to the Orans he would gain favor with the people of Zoada and Loata, who would appreciate the fact that he had not first given Doata the honor of greeting the space-traveler. On the other hand, the advantage it would give him in Doata was to be considered. Yes, it would be better so. Zoada and Loata must wait.

THE woman had not as yet regained consciousness. Moura continued to minister to her from time to time, and was rewarded to find that the heartbeat was becoming stronger. A glow was coming into the waxen skin; her lips, which seemed to have been drained of blood, were red now. They had only to wait until the brain was ready to resume the burden of consciousness once more. Slowly she opened her eyes and glanced about, breathing the name "Dick" once; then she slipped back into her unconscious state.

Moura was again looking into her mind. "Ah," he suddenly exclaimed, "she lives again on her own planet: I see a city, a ship, airplanes, a battle, strange engines. I see men, men very unlike us on Abrui. Ah, I see, I think the machine by which they shot their rocket into space." Ubca sat staring uncomfortably at Moura. It is one thing to read the mind of the man to whom you are talking, but another thing to peer into the sleeping brain of an unconscious being from another world.

"She awakes!"

The voices had disturbed Dana Gleason, for suddenly she opened her eyes and was staring around the cabin wildly. "Dick, Dick, where are you? Why do you not come?"

Then, as her eyes focused upon Moura-weit's strange face and stranger eyes, a cry of surprise escaped her. "My God, where am I?" she asked. "Who are you, and what have you done with Richard Dorr? Oh God—the heat, the explosion, the fall. . . ." Then she covered her face with her hands.

The Taborans could not understand her words, but they could read her agitation and understand her emotions. They knew hysteria; and Moura was not anxious to have an hysterical woman on his hands. He did not know that Dana Gleason was not given to hysteria. Had he the words, he could have spoken and reassured her; but not having these, he sat quietly by, and a force transferred itself from his mind to that of the woman. A calm came over her.

When she looked up again, she was rational. She wondered at this feeling that had crept through her. She knew that all was well. For the first time she saw the strange appearance of things about her. She saw she was no longer in the living-quarters of the rocket. She was now in another room. Through the sensation of a gentle vibration she knew that she was in a machine that was moving. She saw that she was surrounded by a glass wall, and that below lay the darkness of a sleeping country. She saw that she had been made comfortable on a couch, and that she was being cared for by these two men of such strange appearance. She looked down upon her own person and saw where the khaki of her trousers and shirt had been scorched, where a sleeve had been torn, a boot partly burned. She looked more closely at the man seated opposite her on a low stool. She had a knowledge of men, and in this one she saw a leader.

Moura-weit, whose power of telepathy surpassed that of any of his fellow men, now had the opportunity to attempt a thing that neither he nor any other had tried before. Could he project his own thought-images into the mind of a being of another world? Could it be done at all? He knew already that the brain of this woman differed somewhat from those brains of his own race. The two main lobes were of different shape and thickness, and their convolutions took a different form.

Leaning forward, he reached for her hands, and by magnetism of his eyes forced her to look into his own. She did not remonstrate; caught by his stare, she looked back. Moura then attempted to fill her mind with his thought-images. He began with something she was familiar with, the rocket.

Dana Gleason knew no emotion when the silver man took her hands in his. She did recognize that some bond existed between them; for even in her wild dreams her

subconscious mind had been aware of his searching eyes. She was without thought, unable to think, as if her mind had been literally washed clean. Then her thoughts became clouded. She began to recognize that this cloud was night with stars twinkling.

For a time she tried to fight against the cloud, but it was mastering her. When she at last gave in to it, she became aware of a darker spot in the cloud. Gradually the night passed, and she saw the dark spot taking shape. It was long and cylindrical, and it was black and ugly and fiery. It was smoking, it was burning. Now below the rocket appeared a landscape, an inhabitable land bathed in a reddish light. Three times night descended upon the rocket, and on the third night it was evident that the rocket was about to fall to the ground. She saw it fall; she saw its fiery course, the explosions, the flying débris, her own fall!

She saw Ubca-tor pick her up and carry her to the flyer. She saw the plane circling the wreck, searching; and she knew they were searching for another body. None was found! It showed her the heart of the burning rocket, flames leaping up fifty feet. Now she saw the approach of the Gora, and recognized them for barbarians. Then the retreat of the plane. With that the vision vanished. Moura dropped his hands, freed her eyes.

FOR several minutes she did not move. Her eyes said nothing. She was remembering the last minute on the rocket before that awful explosion that had torn her from Richard Dorr's arms. "We can at least die together," said Dick. "He can't take that away from us!" Only He had taken Dick's life and given her hers. Dick dead! Impossible. Something, a feeling, a voice, was telling her that he lived. Still, no man could live in that conflagration she had just seen. Had she really seen all that happened? Was it all? Could not Dick have been thrown out just as she had been? Those brown men, the barbarians—perhaps they found Dick? If only it were so.

She could not cry, tears would not come. A cold lump lay where her heart had been. She now remembered that this strange man with his stranger eyes had come into her mind and pictured to her all that had gone before. What manner of man was this? Where was she, then? When she and Dick thought they were about to die, they had already reached another planet that was waiting for them. If only they had known, and could have landed in their waiting plane.

That was over, however; all over. Happiness, it seemed, was not for her. What was there for her? Existence on a strange planet, a new life, new interests? What new interests could she have? Oh, she wanted to cry, to turn her face to a blank wall. And since she could not cry, since she could change nothing, there could be naught for her to do but to accept things as they came. She sighed deeply, then turned her interest again on the two men and the chamber in which she lay.

She saw that the walls of the cabin were of glass, and above her she could hear the beat of wings. A few yards from her was set an instrument-board on which were a series of levers, dials, and strange instruments. A carpet covered the floor, and there were several low easy chairs and the couch upon which she was lying. Through the glass she could see the black shapes of mountains below and an occasional light shone out. Above was a moon, a moon that sent out rays of weak light. Myriad stars glowed brilliantly.

She turned now to Moura-weit. Her eyes asked a question; and, understanding, the man formed the word "Abrui." She repeated the word, and in turn pointed to herself and thence out into the dark sky. She pronounced the word "Earth."

She realized the necessity of learning the language of the people among whom she had descended. Pointing to herself again, she next said "Dana Gleason." Moura said the name after her, and, pointing to himself and then to Ubca, gave their respective names. The next half-hour was spent in pointing to objects about them and calling them by name. Dana repeated each word. Taking a small notebook from a pocket, she jotted down each word, spelling it as it sounded to her ears. The little book and pencil interested Moura, and he asked to examine them. Taborans write on sheets of thin metal, and in writing use a brush and a thick paint. They have no printing-presses. From the original hand-painted copy subsequent copies are photographed.

Feeling in her pockets, she now discovered that she had about a half-dozen packages of cigarettes left, also several cakes of chocolate. She offered a cake of the latter to the two men, and they enjoyed the taste. Next she extracted a cigarette, found that her patent cigarette-lighter still contained some fuel, and lighted it. She extended the package of cigarettes to Moura and Ubca. They each took one.

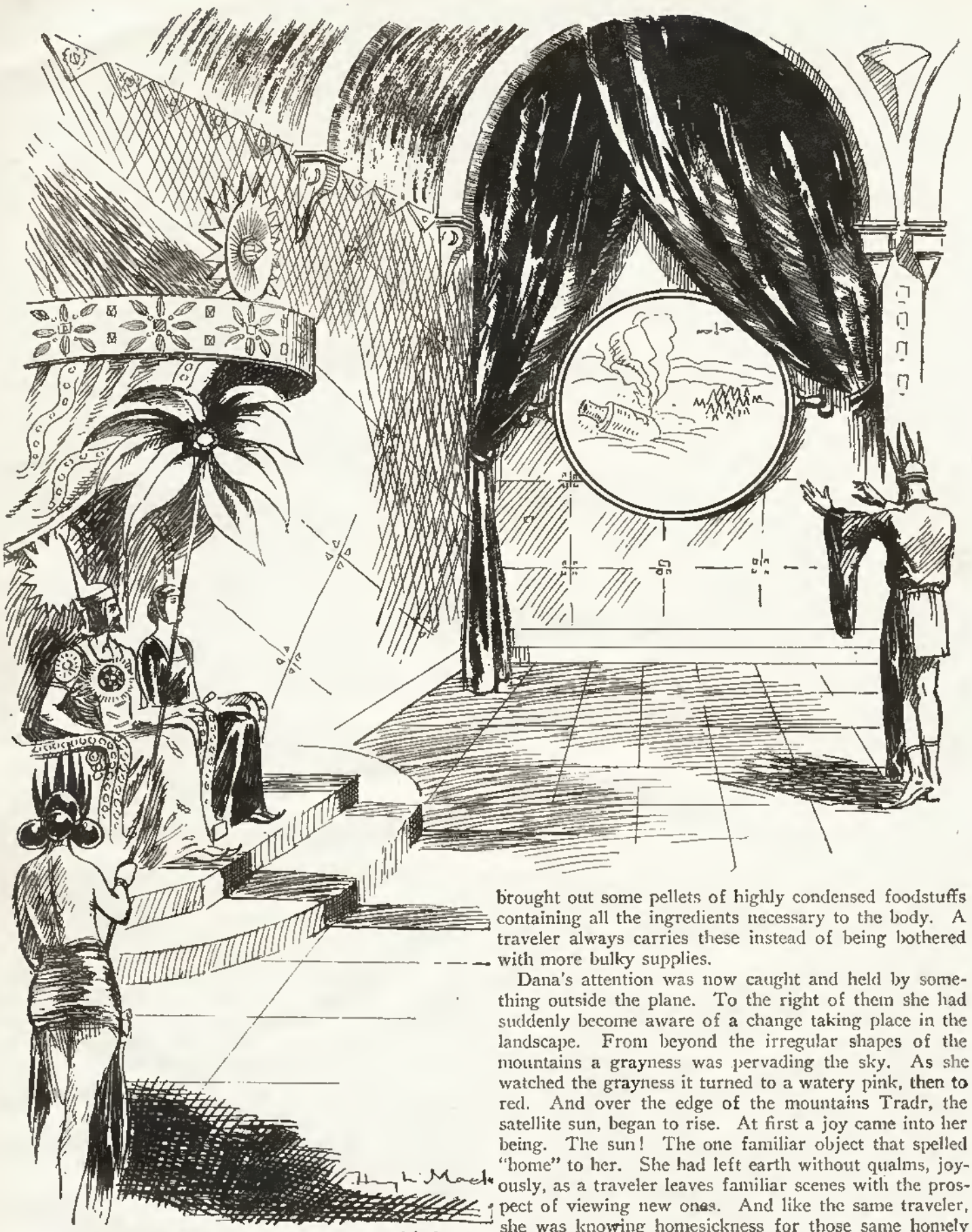
At the flash of the lighter, both men drew back. They exclaimed aloud when they saw the woman put fire to her cigarette and breathe the smoke from her mouth; for on Abrui there is no fire! However, that statement is somewhat misleading; for instantaneous combustion is known and understood, and Taborans are familiar with the fact that the great bright stars are flaming; they themselves, however have no use for fire. In a world that has radium for fuel, heat and light, it is unnecessary to produce fire for man's use.

Therefore it is easy to picture the wonder of the Taborans to whom fire is merely an accident, at seeing Dana Gleason deliberately set fire to her little paper tube and breathe in the smoke. Their wonder was greater even than that of the first European who saw American Indians smoking their pipes.

RATHER gingerly Moura accepted the lighter. Dana showed him how to light it, and he was careful that the flame did not reach him; for Abruians know how painful fire can be, even though they work with an element that can burn and hurt far more severely. He managed to light the cigarette, but one mouthful of smoke was enough, and the woman could only laugh at the ludicrous face he made. Ubca made no attempt to light his cigarette but returned it to the Earthling.

She smoked her cigarette with rare enjoyment; but seeing that the smoke of it distressed the two men, she quickly extinguished it. Moura had taken his cigarette apart, and he saw that it was made of some sort of dried leaf. He slipped it into the small pouch he carried hanging from his girdle. Later he would analyze it and see what it was. He was glad for the little incident, for he saw that the laugh had done the woman good, making her forget for the moment her past experiences and bringing color to her cheeks.

Ubca arose and went to a small cupboard, whence he



At a sign from the Kirada, a tapestry high on the wall was drawn aside, revealing a large plain metal disc. The light was made low, and the weit was commanded to project the scene of Dana Gleason's descent upon Abrui for all to see.

brought out some pellets of highly condensed foodstuffs containing all the ingredients necessary to the body. A traveler always carries these instead of being bothered with more bulky supplies.

Dana's attention was now caught and held by something outside the plane. To the right of them she had suddenly become aware of a change taking place in the landscape. From beyond the irregular shapes of the mountains a grayness was pervading the sky. As she watched the grayness it turned to a watery pink, then to red. And over the edge of the mountains Tradr, the satellite sun, began to rise. At first a joy came into her being. The sun! The one familiar object that spelled "home" to her. She had left earth without qualms, joyously, as a traveler leaves familiar scenes with the prospect of viewing new ones. And like the same traveler, she was knowing homesickness for those same homely familar things.

Yet, as the sun rose higher, she became puzzled. Sol had never appeared so large and so brilliantly red from earth! Then he turned a lavenderish pink. What had happened to him? Here she was many millions of miles more distant. It couldn't be possible that he . . . No that

was not Sol. She stared in wonder, almost in fear. Her eyes sought Moura's.

He knew what was passing through her mind. Pointing, he showed her Sol high in the sky, it was the sun she had mistaken for a moon. Then she understood, and her wonder grew greater as she stared at the strange sun at which she could gaze directly without blinking.

They were now on the edge of the pretty country of rolling hills, large forests, wide estates, and serene meandering rivers. The second sun was now rising high in the sky. Dana Gleason saw all this with a disinterested eye. With the coming of the sun she had sunk into an apathy from which she could not arouse herself. The first excitement of the landing was gone, the strangeness of the things around her had lost their interest. Her heart was cold and her eyes dry. The landscape looked barren, the sun's bright light weak. She had won love on a gamble and lost it. She wanted to die, but was living. Life was giving her another chance, and she did not want it now.

Moura now suggested that she lie down and sleep. He did not like the look that had suddenly come into her eyes. He wanted her to be fresh for her interview with the king. By motions he expressed what he wanted, and without a word of protest and as docile as a child, the woman acquiesced. Moura recognized the fact that this woman was going to be as putty in his hands, and he smiled to himself as he thought of what would come.

LUCKY that Ubca-tor could not read his thoughts; for the youth knew nothing of the brain of Moura-weit. He could only admire him, glad to shine in his reflected glory. Ubca-tor, the son of a minor prince, had no ambition. From childhood he had been taken by Moura-weit, and he was happy when that man accepted him as a companion, though he never was a confidant. He did not realize the fact that his hero accepted him, only because of the advantage it would mean to be associated with a prince and in order to let the masses know that Moura-weit could pick his followers from the princely body. And had he known, it is possible that he would not have remonstrated. He feared, and at the same time loved, the one he fondly called master, and gladly he did what the other directed.

Now as he gazed on the youth, Moura-weit saw that he was staring with intent eyes upon the sleeping woman. He was attracted by her strange coloring, her red lips, her distant air. And in the boy's unguarded mind Moura read an awakening, a fascination for the stranger being. Moura chuckled to himself.

The Taborans

SO came Dana Gleason to Doata. The capital lay on the bank of the Fierutl River that ran down to the ocean. The city was built, as all Taboran cities are built, on a promontory. One side was a gentle sloping hillside that rose a thousand feet, and the other side a sheer bluff rising straight up from the wide river.

On the cliff's crest, a space almost a mile and a half long and half as wide was given over to the palaces of the Kirada, the royal heir to the throne, together with the great Council Chambers, the Government Courts, and the barracks that housed the members of the Royal Guard.

Below its crest the hill had been cut by terraces, terraces that marked the ranking of the people who inhabited them. The first two terraces were given over to those of royal blood, the taiis (crown prince and crown princess, and the tors (lesser princes). A wall, moss-grown and vine-covered, separated these terraces from the next below. Ten such terraces lay in order, all joined together by wide flights of stairways, the center one rising directly up to the palaces on the top.

The last terrace belonged to the rank of the Weitas, and here dwelt Moura-weit in the home of his fathers. A high, straight, unclothed wall divided this from the city below, where dwelt the commoners. Rarely did a commoner ever climb the steps that led over the wall separating the lower and upper cities.

Among the commoners were as many classes and castes as among the nobility, if not more, from the commonest laborers to the skilled artisans and the foremen and superintendents that directed their labors.

As for the houses of the Taborans, none was built taller than one story, and all were of uniform stone with glass roofs, and each had a bit of garden surrounding it. No house in the whole land rivaled that of the Kirada, nor did any other house rival those occupied by the taiis. The size and beauty of the home was entirely determined by the rank of the family to which it belonged. So were the furnishings that went into it, the food, the clothing, the fittings, the slaves.

ONE can liken the social system of Tabora to that of Peru, under the Incas, since all men work for the state and their worldly goods are meted to them according to their standing in the community. And no man is a slacker. Each is given the work that is best suited to his temperament; he is given the right to choose his vocation and is taught his profession in the state's universities.

Nor are the Taborans held by iron-clad rules of class. Let a man prove himself worthy of a higher position in life and he is given it gladly. A laborer may become a superintendent, a mason, an architect, a miner, an engineer. Even princelings gain a place in the sun only by their own efforts.

Dana Gleason had awakened from her nap and saw the strange city stretching below. On the wide plain surrounding the sloping hill were thousands of small houses, each set in its own plot of ground with proper regard for the general symmetry of the city. The glass roofs shone brightly in the sunlight, glowing like thousands of jewels. The plane had been hovering over the city, and it could be seen that its presence was noticed by the people in the squares below.

It would be well here to describe the Taboran plane, built as it is along the lines of the one bird of Abrui, the oc, a waterbird that has no feathers and whose wings are bat-like. The wings of the plane, like those of the bird, beat the air; and both wings and tail are controlled in a natural bird-like manner. By simply balancing the machine by a gentle motion of the wings, the plane can be held in one position, can rise straight up into the heavens or drop straight to the ground. Ubca had pulled a lever, and by tilting the wings they now were dropping gently.

It was the rest hour in the city, when all work is suspended for a fourth of a ro*; and people were stretching themselves and chatting together in the sunlight. Immediately on recognizing the blue of the plane with

* One ro is equivalent to two hours and ten minutes of earth time.

the emblem of two staring eyes on the under side of the wings which Moura-weit affected, a great halloo came up from the city to their favorite.

In answer to the salutation, Moura dropped on the heads of the populace a basketful of artificial flowers that Ubca had taken from a cupboard earlier, and in the midst of this shower the plane descended to the terrace upon which Moura-weit dwelt.

There is no need of describing all that took place in the next few hours—the visit that Moura-weit made to the palace to inform the Kirada in person of his find, the great reception that was given the earthling in the Palace, to which the flower of all Tabora hurried on summons, or the garments into which Dana Gleason was put or the homage that was done to her by all.

A small throne had been placed for her beside that of the Kirada and Kiradaf (queen). The great throne-room, whose walls were lined by solid slabs cut from semi-precious stones, was filled to overflowing. Rare tapestries, exquisite pieces of carving, wonderful plaques of rare metal hung on the jewel-encrusted walls that sparkled and glowed. Moura-weit had taken his place at the foot of the dais, and in a voice that held the attention of all and with well-chosen words, he described all that had taken place. At a sign from the Kirada, a tapestry high on the wall was drawn aside, revealing a large plain metal disc. The light was made low, and the weit was commanded to project the scene of Dana Gleason's descent upon Abrui for all to see.

The Movie on Abrui

FACING the screen, Moura-weit proceeded to describe the scenes that had actually taken place, and before the assembly, the same events that Moura-weit had shown to Dana Gleason earlier were broadcast. At the same time every house in the land was given the same vision on the sensitive vision screens. Only a few men in the realm were able to do what Moura-weit was doing, and he was an acknowledged master of that art.

It is in this manner that most of the news of Tabora is broadcast over the land; and men are trained for this work alone. Sometimes it takes several men combining their efforts to project their thoughts, so that all can see. Strange as it may seem, Tabora does not broadcast the voice as we do on Earth. Instead, the actual scenes are thrown on the screen, and by way of explanation, words are also sent out in the same manner.

The reception ended after the Kirada had presented Dana Gleason with a mansion on the terrace of the taiis, the terrace that heretofore had been occupied only by the direct descendants of the royal family. To her were given all its privileges with jewels, fine clothing, and great riches. To Moura-weit was given the right as her guardian to dwell in the palace of Dana Gleason.

The Earthling gave thanks in her own tongue. Later it was arranged that a great teacher was to instruct her in the language of Tabora.

For many days thereafter Dana Gleason's reception-room was filled with callers, men and women who had been absent from the great assembly in the Court. The women were anxious to have a glimpse of a woman from another world, the men were fascinated by her strange coloring.

Several noblemen also sought the hours when Rieuta-Dak (Dak-master) was with her teaching her the Taboran tongue. This group of men elected to learn her language even as she learned theirs, so for every Taboran word she learned she gave its English equivalent. And by the time she showed some proficiency in Taboran, her pupils were almost as proficient in English. Moura-weit and Ubca-tor were often present during the lessons, but they did not take part in the little club these men decided to form. And they gave their club the name that meant Earth-club, Roata, for by this time they had discovered that Dana Gleason was from the planet that was third from the Sun and was called Rui in their language. It was greatly due to this light-hearted little gathering that Dana Gleason got back her heart, enjoying it all as much as they rejoiced at speaking her mother tongue.

When she could speak the language well enough, she explained to a small gathering of astronomers the physical aspects of her planet. The Roata listened to the tales of her own world. They were anxious to learn its games, its pastimes; and not wishing to be outdone by their tutor, they learned to smoke her cigarettes. One Uila-jor, who had vast plantations, found that a certain weed that had theretofore been considered worthless made a very fine smoking-leaf. He set up drying-rooms and put a number of slaves to work growing the leaf and making the cigarettes so that the Roata would not be without their smokes; for Dana's small supply was quickly depleted.

Now that her knowledge of the language was quite good, the time came for her to visit Ora. Several of its scientists had already called upon her and were anxiously awaiting the day when she could converse easily with them. The Roata insisted upon traveling with her. Moura-weit also accompanied her, and Ubca-tor, together with a brother of his, Tapor-tor.

On the island of Ora they were given a palace, yet there was none of the pomp that marked her welcome at the Kirada's court. Here everyone met on equal footing. In the great auditorium of the Hall of Knowledge Dana Gleason faced the assembly of great minds and told the facts of her journey through Space. Questions were asked, and she quietly answered them. She told all she could about her home planet. Her early training under some of the greatest minds of earth stood her well, and day after day she stood upon the rostrum telling of earth, its peoples, its thinkers, its astronomers, its theories.

Women asked her of the social life there, of women's accomplishments, of child-welfare. Soldiers questioned her concerning wars on earth. Statesmen wanted to know about politics, about economics, about statecraft, diplomacy, and she had to answer numberless questions asked by members of all professions.

Then Dana Gleason commenced asking. She learned all there was to know about the Taboran understanding of mechanics; of airplanes, of radio, of astronomy, and other sciences; and something of the history of the country. She learned that man's development here was hardly more than upon earth, and only because of his possession of that one element in plenty (that is upon earth a rarity) has the Abruian progressed further than the Earthling.

The Orans were anxious to aid her in building a radio such as she described and which was unknown upon their planet at that time. Yet they doubted the possibility of electric vibrations carrying across the great Void. She was impatient to begin immediately; but Moura-weit wished her to continue her travels, for he had other plans.

Already Moura-weit had discovered that Dana Gleason was invaluable to him. Through her he had risen from the terrace of the Weita to that of the Taiis, and already he was hearing himself addressed as Moura-tor and men were listening to his word quietly without recourse on his part to oratory.

A World Tour

WITH their escort of thirty planes, ten of which contained members of the Kirada's personal guard, and ten the female guards that had been presented to Dana Gleason, and whose planes now carried her insignia of a rocket emblazoned on the wings, the party headed for Zoata. The trip across the ocean was one of interest. There were the long low ships that ply across the waters carrying heavy freight from country to country. These ships could be compared to the "whalebacks" of the American Great Lakes. They drew a hundred feet of water and lay low in the water, with their hatches covered. The crew lived in a small house at the bow. The ships were run by means of a simple radium motor and traveled at a speed of 62 cu, as Taborans figure speed, about 150 miles per hour.

Islands dotted the ocean, and great flocks of the single bird of Abrui, the oc, flew about or settled either on the water or on the islands. A large fleet of airships, shaped like balloons, and of great size, passed them on their way to Loata, bearing lighter freight than the ships on the water.

At Treij, capital of Zoata, Dana Gleason was received with the same splendor as in Carajama. At Oiugut, capital of Loata, it was the same. The entire tour took over five months or duits; for at each stop they lingered many days. At both capitals and at Ora Dana Gleason made it a point to meet women, to learn what she could about them, and to understand them. She remembered her promise, made aboard the Rocket, to accept her rightful heritage as a woman, and to do what she could to aid her sex. It was as if she had erased her past life from her mind. Both Zoata and Loata presented her with a mansion and placed slaves and wealth at her disposal.

In the meantime Moura-weit, now known as Moura-tor, was doing what he could to insinuate himself into the esteem of the people of both these nations. His name had gone abroad among the masses, and they acclaimed him everywhere. He had the chance to prove himself a great man, and the Kiradas of both Zoata and Loata granted him private audiences. Statesmen paid him homage, accepting his aid in weighty questions.

Back in Carajama, for they returned there with a great welcome, Dana Gleason settled down in her palace. The Kiradaf Moule was a kindly woman and sought her companionship, and the royal daughters were often in her atoll. Dana Gleason found that the lot of the Taboran woman was not an unhappy one. Women, as well as men, did their part in the nation's work, and wives were as well acquainted with statescraft as were their husbands. Nor were they denied the right to do any manner of work they desired. To understand more of the social system of Tabora, it is best that something of it be explained.

Of amusements there are many varieties, men and women taking part in everything alike. There are singers, poets, and actors, and most of the arts are broadcast into every home. There are holidays on which games are played by both amateurs and professionals, contests of strength, and swimming. Men have clubs wherein they may gather, and there are the same for women. The state thinks well of its people, and knows how to keep them content.

IN her home Dana Gleason had a gymnasium set up; for she had no intention of allowing herself to grow weak and flabby. There she kept in trim, running, fencing, and boxing, not to mention the swims in her own pools. The Roata still courted her favor, and they practiced with her in her gymnasium, teaching her their games while she taught hers.

She visited about with the Roata. Uilajor and Yidvetor both invited her to their plantations, and she spent a great deal of time at them. The plantations were conducted with military discipline. There were superintendents, overseers, foremen, laborers, and slaves, not to mention the large company of herdsmen who watched the great flocks of muti.

Abrui has but a few animals. In the mountains are several species of wild animals, which the Taborans hunt, not for their flesh but for their beautiful hides. A beast of burden is unknown; the only domestic animal in addition to the muti is the ayop, a small long-haired creature somewhat like a cat, which the women favor. In the mountains traveling is difficult. Slaves are bred as carriers, and can bear twice their own weight on their broad shoulders. The overseers use these men to bear them rapidly from field to field, and on hunts these golden men carry the hunter over the rugged passes.

On returning from one of these jaunts into the country, Dana Gleason arrived at Carajama to find that Moura-tor was now a great man. Among the three nations of Tabora a dispute concerning a tax on imports and exports had been brewing for a long time, and the indications were that if the dispute were not settled war would surely take place. None other than Moura-tor himself had been sent as special envoy to straighten matters out. He was highly successful, and the three nations of Tabora were knitted more closely together than ever before. Moura-tor was acclaimed throughout the cities, and, whereas men had earlier whispered "Moura-Ur-tor" (over-prince), now they cried it aloud in the streets.

Next had come whispers from the borders of Tabora that Gora was arising out of the slough into which she had been cast centuries before. The raids of the Gora into the fertile plains, where were great flocks of muti, were becoming more daring, more defiant. Consequently Moura-tor went to Hierpowi, the capital of Kirada Yal, the strongest of all the chieftains of the Gor, who lived in large tribes.

Moura returned from Gora somewhat disquieted. The Kirada Yal had received him coldly. Gora was hostile, but Yal agreed to see what he could do about the raids of his people. Gora felt no love for Tabora, her despoiler. She hoped one day to win back her lands on the shores of Sehti. The men of Gora were numerous now, and one day they would swarm over Tabora. No, not now, but sometime later. Perhaps in centuries to come. So much had Yal spoken, but Moura-tor the wily had seen something else in the mind of the Goran king.

AND what he saw greatly disconcerted him. Again he saw the strange image of the man from Earth, the same that he had seen a number of times pictured in

the brain of Dana Gleason, the image of Richard Dorr. He knew him immediately, the man with hair and skin almost like that of the Gora, but whose shorter stature and blue eyes were different.

This knowledge had set him thinking. Gora then had a champion. Hence the reason for the new fearlessness, the new hatred. He knew then that Yal lied when he spoke of succor for his people in centuries to come. The plan was almost ripe!

Not allowing the man to know what he had seen in his brain, he went on to remind Yal how futile it would be for Gora to war upon Tabora. Gora knew little about radium, but Tabora knew. She knew how to disintegrate a man's body, how to dissolve any chemical body. Gora would have no chance. Instead for Gora there was the friendship of Tabora, a brotherhood of the two great races.

Yal listened, but had nothing to say. He kept his own counsel. He reflected that Gora had not had the friendship of Tabora for over a thousand years, nor did she want it now.

Rumors of War

MOURA returned to Tabora with little to say. He advised that a larger contingent of soldiers be sent to the border garrisons and that watch be kept upon Gora. However, he intimated that friendship with the Gorans would be good policy. Tabora could gain much by trading with that nation, for it was known that Gora had fine mines, where much metal and radium could be obtained in exchange for a few of the luxuries that Tabora possessed.

The Councils decided to take up the question, but even with Moura-tor's untiring efforts, it took quite a time to make any sort of decision. Moura made a number of secret trips to Gora, but nothing much came of them. Behind Yal he recognized the now hated figure of Richard Dorr, though that man was never present at any of the conferences.

Moura-tor had no doubt that Richard Dorr was unaware that Dana Gleason was still alive. Between the two races there was practically no intercourse, and the man evidently was left in ignorance of the fact that the woman he loved was but a few thousand miles away from him. Moura wondered of what value it would be to acquaint Dorr with the fact.

And yet Moura-tor had other plans for Dana Gleason. Moura-tor, although in his fortieth year, had never taken a mate. There were but few bachelors among the Yuika, to which class he belonged; but the issue had never been forced in his case, and he preferred a life of celibacy. However, it is needless to remark that Moura-tor was considering taking the Earthling to mate. She looked upon the man as a friend, and he allowed her to consider him as such. His own feeling toward her he did not trouble to define. He knew that it would be well for Moura-tor to wed with the Earthling. The people would be overjoyed at such a match, and it would give him fame. So he was not anxious for Dana Gleason to learn that Richard Dorr still lived.

For many months now Dana Gleason had been living at Ora. With the aid of the Orans she had built her giant radio, but there had been innumerable failures. Earth could not hear her appeals. Life now lost all taste for her. All interest in her new existence was gone, as she realized that she was in truth separated for all time from earth. Yet she tried again and again, building new radios, changing and improving, it seemed an impossible task.

However, the Orans had made use of her knowledge, and now her name was to go down in history, not only as the Space-traveler, but as the inventor of the radio by which Tabora could now transmit the voice through the air. She was a sacred person to Tabora, and wherever she went people proclaimed her name; letters and gifts were showered upon her by a grateful people, and nothing that she could ask for was denied.

MEN were now seeking her out as they never had before. She could have married any man she wanted, but Dana Gleason had no thought for marriage. Her days were quite full, but her nights overflowed with the thought of Richard Dorr. For hours, before sleep claimed her, she lived over again the short life they had had upon the rocket, and waited only for the time when she might die and go seeking him wherever he might be. She had taken Moura-tor's word that he had died in the flames of the rocket. She would have made a pilgrimage to the ruins, but Moura explained that it would be impossible because of the antagonism of the Gora to the Tabora. Still it was hard to think the man dead, he who was so full of vitality, he who had been so richly endowed with the essence of life.

MOURA-TOR had been her only confidant. He had drawn from her the story of her love for Richard Dorr, and he falsely gave her comfort. Wisely he kept from her his plans regarding herself.

However, on the evening of his return from Gora he faced her. He had made a decision. First he would make her his wife. After that he would see that Richard Dorr learned that she was living. How easy, then, to trap the fellow and do away with him, and Dana Gleason never to know! Thereafter with Dorr dead, Gora would be his. Why should not the Ur-tor of Tabora also become the Ur-tor of Gora, which would mean Ur-tor of all Abrui?

He told Dana Gleason of his mission to Gora, also that he had made an attempt to learn if the body of Dorr had ever been found, but the Gora knew nothing of him, and therefore he was conclusively dead! He knew that to bring to life the memories of the man would hurt his cause; and yet it was better that the woman no longer possess any hopes.

Dana Gleason heard him in silence. True, her heart warmed to the man who had her interests at heart, he who had saved her from the savagery of the barbarians. To her, he was her only true friend. The Roata was no more, for each man of it in turn had asked her either to become his mate or, at least, his *amante*. To each she had given the same answer and her reason, and one by one the Roatans had drifted away. Only three remained, and they secretly were building for her a vehicle, which, they hoped, could make the trip to Earth and return. They were Uila-jor, Rexz-tor and Heipa-tor.

Now Moura-tor approached Dana Gleason with the entreaty that she become his mate, to share his triumphs. She looked up wearily. "Even you, Moura?" she asked, and smiled.

Moura hurried to protest that he loved her, that he wanted to give her happiness. He wanted to be a substitute for the love she had lost.

She smiled sadly at that. "Can artificial light replace the sun, Moura; can an artificial flower replace the real?"

He smiled quizzically. "On Abrui we do substitute

the sun so well that the substitute outshines it, and surely our artificial flowers are beautiful." And he touched an exquisite jewel she wore at her girdle, that had been cut in the semblance of a flower.

"True enough; but take away the sun, and you could not light up your entire planet any more than you can give a scent to this jewel."

He laughed, realizing he was bested, but he was not done. "Dana Gleason," he said, "I offer you my love, but you disdain it. Enough! Yet we are not finished there. Doata demands that the Earthling take a mate! We have no monks or nuns, which you speak of having on Earth. All our people do their duty for the state!"

"I am not of Doata, Moura-tor. How can that rule have anything to do with me?"

"You are one of us now, Dana Gleason, and Tabora is anxious that the name of Dana Gleason continue on down into history! She wants one of your name always in her annals that she may venerate you even after you are no more!"

Dana shrugged her shoulders. "I regret that this is impossible. I am the last of my line either here or upon Earth, and it must continue so. No. Moura-tor, go to your Kirada and tell him that Dana Gleason does not like such an arrangement!"

The man laughed an ugly laugh now, that brought surprise to the Earthling's eyes. "We shall see. I must go now, for I still have some matters on hand to attend to before I retire. I bid you good-night." And he was gone.

A Friend in Need

FOR some moments Dana Gleason sat where he had left her. She became aware of a slender little golden-skinned slave-girl who had crept to her side. She was Dure, Dana's personal slave, a girl to whom she had become attached. Dure was just her own height, and Dana Gleason often thought she saw in her features a resemblance to herself.

"My mistress, you are sad to-night?" she asked softly. "Sadder than you usually are when night falls."

Dana nodded. She had told Dure something of the love she had lost, for Dure knew of her sleepless nights. She told her now that she had learned that he was really dead.

"I heard much of what this Moura-weit (the slaves of Carajama had no love for Moura and never deigned to call him by his new title) had to say to you. He is an ambitious man, my mistress, and he seems always to get what he desires. Beware of him!"

Dana Gleason had nothing to say. She cared not at all for the ambitions of the man. She was sadder now than ever before, with the news that her lover was truly dead. Dure, seeing that she was occupied with her own thoughts, turned away, and Dana got to her feet. She strolled out into the garden.

Night had settled now. The distant sun was lighting Gora, and in the sky only the brilliant stars were showing. A few glowing lights were evidence that some of her neighbors had not yet retired, but their lights did not penetrate into the thicket of shrubberies that surrounded her favorite nook and formed a bower over a stone bench.

Looking into the sky she tried to distinguish the planet earth in the firmament, but she knew that earth's gleam was not strong enough to give much light at this great distance. Only with strong telescopes could it be seen close to the sun. Nor were any of the constellations she had known from earth visible here, although the distant stars shone more brightly because of the fact that Abrui is many millions of miles nearer them than is earth.

Moura's words had caused her some disquietude, and she could not shake off the vague doubts and restlessness that had crept over her. She knew that some big issue was at hand, and she must be careful to see that she was not forced into something she did not wish.

Repelling these thoughts, she allowed her memories to dwell again on Richard Dorr. Strange that Moura's words had not seemed to ring true and Richard Dorr seemed very close to-night.

Suddenly she became aware that she was not alone. A tall slender figure was coming toward her? Could it be he? Could the dead come to claim her? But no, she quickly recognized the voice of Ubca-tor, who so often visited her and sat mooning on her chairs.

"Dana Gleason," he murmured, "I prayed that you would be here."

"And why should Ubca-tor pray for such a thing? Is it not strange for you to be calling at such a late hour?"

"Not strange, for I know it is your custom to come here always at this hour."

"Then you have been keeping me under surveillance?"

"Only the surveillance of love, Dana Gleason. Ah, how many hours I have spent watching you, always watching."

"You, too, Ubca? Must every man in the Kirada's court offer me the same thing—love? Is it not answer enough that I refuse each one?"

"AH, Dana Gleason, you mistake me, for though I do love you, I come not to ask for love in return. I come only to sit and bask in the warmth of your presence. Send me not away, for I would be a slave to you—anything, that I might be near you."

A low laugh escaped Dana Gleason's throat. Too many had asked her for the same thing of late, and now it was this callow youth. She was about to say something caustic to him when he spoke again.

"You sit and watch the stars each night. Do you then know an old legend that has been handed down from the days when our race believed in godlike beings?"

She admitted she did not.

"It is a pretty legend. It tells us that the stars are the eyes of lovers who have died and left their loved ones here on Abrui, and they, with a lover's ardent gaze, are seeking the one they left behind. When they find that one, they then turn their glowing eyes upon all who dare to love the one of their heart and pierce them through and through with the gleam from their eyes, so that the presumptuous one becomes mad for evermore!

"Ah, Dana Gleason, were I only a star to make raving maniacs of all who would dare to love you."

"That is a pretty story, Ubca, but you forget in your ardor to ask if perhaps there is not one who has precedence over you. Perhaps it is one who loved and died, who looks to find me, only to stab you through and through so that you might become mad."

"You mean, then, that there is another? It is not Moura-tor to whom you propose to give yourself? Many nights I have lain in fear that this might be the truth! For though I realize how young and foolish I am to presume to love you, I should hate to see you favor Moura-tor, who seeks you only through his love of ambition.

"Many years I have loved Moura-tor, but of late I have grown to hate him. Did I know that he truly loved

you, I should be satisfied, but now I know that Moura-tor loves no one but himself! Promise then that you will never mate with him, and if ever you need help, you can call on one who holds you in reverence!"

As he spoke, Dana Gleason's impression of the youth changed. She knew now that here was a true friend, and she respected him now in his attitude toward her. She told him of Richard Dorr, and promised him solemnly enough that she would never marry Moura-tor.

As she spoke, Ubca-tor was remembering something else. He remembered the night when they had discovered her limp form. And he also remembered the body of the man he took for a Gora. Excitedly he asked that she describe Richard Dorr for him. She did. Then, in a voice that shook, he told her what had transpired.

"The Gora found him. I know he was living. They must have taken him for their own, and possibly he is with them now!"

A GREAT silence fell upon her. Then she was right! Richard Dorr lived! Quickly she repeated all that Moura-tor had told her. Ubca was convinced that Moura had lied. "Something is behind all this, Dana Gleason. It would be well to discover what we can! Wait . . . I will go to Gora. I know their language; I can disguise myself as one of them. I will seek, and perhaps I shall find Richard Dorr for you!"

"Go then! and I will go with you. I too can disguise myself."

"No, no; your absence will arouse comment. Moura will know then. If I go alone he will not even miss me, nor care. I must not see him; for then he will read what goes on in my mind. And you must try to keep him from reading your thoughts, though few can stand against him."

"Hurry then, and may God be with you!"

"I like this God of yours, Dana Gleason. We of Tabora have no God; but if there is really such a spirit, let him look after you while I'm gone!"

And the boy left on his self-imposed mission. A new hope had come into Dana Gleason's heart. Did Dick but live! She was praying now to the God he had taught her to love. Now let Moura-tor attempt to win his case. He could never accomplish his purpose.

To make this more certain, Dana Gleason, with a company of her guardswomen and Dure, her slave girl, embarked for Ora, where she knew she would be safe from Moura-tor. Once before she had run away to escape a man, Howard Courtland.

Moura realized that his purpose was thwarted for the time being, and though he sought Dana out at Ora, she laughed at him, taking care to keep her mind a blank so that the man could not read what hopes were there. She succeeded, and Moura returned to Doata none the wiser. A duit passed before Ubca returned. He came to Ora.

"It is true, Dana Gleason. Richard Dorr lives!"

A cry escaped her lips, and she sank into a faint. Frantically Dure and Ubca hastened to restore her. She revived, feeling embarrassed at her weakness. She demanded more news from Ubca, her heart singing within her bosom.

Ubca's eyes were mirrored with pain. He had learned a lot in Gora, and he was worried. He had discovered that Gora intended to make war upon Tabora, and that Richard Dorr was behind the movement. Still he was certain that Gora could not win, but there would be bloodshed. And he had not seen Richard Dorr in Gora because at the present time he was in Tabora!

"I think," said Ubca slowly, "I can find him for you, Dana Gleason, but to do so and not turn him over to my people would be criminal; for, without his leadership, Gora would not consider war against the Uriem (the death-ray) of Tabora."

Dana was exultant when she learned that Dick was in Tabora, closer than before. She decided to return to Carajama immediately. She was certain that Dick would hear her name and come seeking her. "It is well," she told Ubca, "that you do no more. Richard Dorr will come to me. Then I will persuade him to give up his attempt to bring the two races to war. Trust me, I will do all I can to avert it. Come, let us return to Carajama. But first we must let it be known throughout Tabora that Dana Gleason returns to Carajama, so that he will be sure to hear my name and know where to find me."

"I will attend to that," Ubca agreed.

In Carajama, Dana Gleason had a royal welcome. That night her palace was filled to overflowing with people of the court. She was happy, happier than she had been since her coming to Abrui. Her eyes glowed, and there was fresh color under her skin. Men did her homage that night, and the women were suddenly jealous. Moura-tor was absent, being out of the city that evening.

The Great Plan

AFTER the last guest had gone, Dana Gleason stood peering into the garden, anxious to make sure that her nook in the shrubberies had not been sought by anyone else. Dure came to her side. "My mistress," she whispered, "I have news of Him!"

"Him" meant but one person. She asked Dure for her news. "Your Richard Dorr is in the city now! He is here on a secret mission. His dealings are with the people of Moata alone. Mistress, he promises us freedom!"

"What do you mean?"

"It is a wonderful plan! A plan by which we are to rise against our master (her voice was very low now) and join ourselves with our ancient ally the Gora. This Richard Dorr is a great person, mistress. The golden people already love him as they hate the Tabora. You have been kind to your slaves, and they are anxious to return your kindness.

"To-night Richard Dorr will seek you out—in the bower!"

Dure's words had brought tears to Dana's eyes, and now, without a word, she hurried out into the garden. Richard was waiting for her in the bower and she rushed to his arms. It was Dick, but a Dick transformed. His skin and hair were now as silvery as any Taboran's, only his blue eyes were the same. For some time neither spoke, content only in each other's nearness. Then they told each other the story of their experiences since their arrival on Abrui. Dorr had been picked up by the Gora more dead than alive. Thinking him one of their own, they revived him. On discovering that he had come out of the rocket, they would have killed him. But he had been taken to Kirada Yal for judgment. Yal saw in the Earthling the answer to a prophecy made centuries before—that there would come a stranger man, one who

was like themselves yet unlike them, who would come wearing strange clothing, and with strange words on his lips, who would lead Gora back to the lands, of which she had been deprived. So Richard Dorr was acclaimed to be the promised savior for whom they had been waiting.

"Their plight is pitiful, my dear. They eke a mere pittance from a barren soil; they are always hungry, and have little to cover themselves with; and the Tabora kills them when they come to the borders to steal enough to feed their babies. So I have sworn to free them from this awful bondage! Nor are they the barbarians the Tabora makes them out to be. They were civilized centuries before the Tabora. But in their struggle for existence they have no time to give to science; hence they are fast deteriorating into savagery."

"But, Dick, you can never fight against the Tabora. They have superior weapons, better brains!"

"No, you are wrong, Dana Gleason! True, they have a better weapon, but I have discovered only today the secret that will make its power nil; and they have only this one weapon! They have not been at war for centuries, and I have just come out of a war. Remember I was an engineer during the war on earth, and made it a point then to study artillery, too. No, Gora will win."

"Do you realize what you are doing, Dick, in bringing war to this planet? Have you and I not had enough war?"

"That is not the question now. If there is no war now, there will be one later. And not until there is bloodshed, can Gora have the comfort and ease of which she has been despoiled.

"Oh, yes, there is a possibility of trade being established between the two races, but believe me, it will be Tabora who will get the best of the bargain. A diplomat by the name of Moura-tor came to Kirada Yal with promises. What are promises? Pieces of paper, treaties, Bah!

"Naturally, I have thought all this over carefully. I do not like the matter of throwing this planet into warfare, but only through war can justice be done. Gora wants her place in the sun, facing the Sehti ocean. She and Moata will have that before I am done!

"Surely you, Dana Gleason, can not countenance one strong race lording it over another. True, the Tabora has culture, a fine social order, great learning; but why must she have it alone? Why should not these other two races share and share alike? I have already been to Ora, where I was received kindly. The great minds there agree that I am right, that Tabora, Moata, and Gora should live peaceably side by side! Can you say differently?"

HER silence was her answer. Then she told him of what Ubca-tor had done, the danger that Richard Dorr now had to guard against in Carajama. He laughed aside her fears. "They will do nothing to me; and were they to capture me, Dana, I should not be a prisoner long. Moata will stand by me as one man!" He gathered her in his arms again.

"My work will be finished here in another day, and I shall return to Gora directly. Before I plunge Abrui into war, Tabora will be advised, but I am certain she will not agree to terms. Then it will be war, a war that will not last more than a day or two! Then, my sweetheart, I will return for you."

"You will return for me . . .? What do you mean, Dick Dorr? You don't think that you are going back to Gora without me?"

"How can I take you back with me, Dana? It's a hard road back, and Gora offers you none of the comfort you have here. No, you must wait!"

The woman stared in wonder. "You are talking that way to me, Richard Dorr?" she demanded. "What do you think I have degenerated into? Have you forgotten who I am? Do you think that Dana Gleason has become a weakling? Why do you talk to me of comfort, of fearing a hard journey?"

The man smiled. "I see you have not changed, Dana, but all the same I do not want you to suffer any more hardships—besides. . . ."

"Besides what?"

"Well, my mission is a secret one, even though your Ubca-tor discovered me. Were I captured, I should be killed as a spy. And to take you back with me would most surely raise a hue and cry."

"And you think I can not plan as well as you?" She laughed softly. "No, Dick, we were separated once. I won't allow it to happen again! I have a slave girl who is my height, resembles me somewhat, and it will be easy, I am sure, to disguise her as myself, announce that I am returning to Ora, and then let her take my place. Several days will then elapse before the deception is discovered, and by then they will not know where to look for me."

"Good, then. That is settled. How much easier my work will be with you by my side!"

The hours of night passed swiftly. Soft tendrils of light aroused them to the fact that Tradr was rising. They had one more caress. "We shall leave two nights hence! I will come again to-morrow night. Wait for me, my darling!" And he was gone. Slipping out of the garden, he appeared with the early risers as he descended to the lower city.

Plots and Counterplots

DURE was waiting for Dana. She had fallen asleep on the floor, but she awakened as she heard the light, happy step of her mistress. She insisted that the woman lie down for several hours of sleep. She awoke later in a blithesome mood. With a smile she received Moura-tor, who had only just returned to Carajama.

"I have only just heard that you had come back from Ora, Dana Gleason. Am I to take your return to mean that you have accepted me? You will go to court to register today your decision to marry me?"

At his words, her happiness departed. She had forgotten Moura's plans for her in her own joy of finding Richard Dorr. She must somehow stall Moura along until she was ready to depart with Richard Dorr. She was thinking this when she realized that she allowed her thoughts to escape her. In terror she looked into Moura's eyes, and saw that he had indeed read what had passed through her mind. For the first time she saw the real man behind those cold glittering eyes. A short laugh escaped him.

"So you thought to defeat Moura-tor, eh?" He laughed again. "Yes, I know your lover Richard Dorr is in Carajama. I, myself, have just returned from Gora. Here," and he held forth a metal scroll, "is a treaty I have just drawn up with Kirada Yal.

"For providing Gora with foodstuffs, clothing, and whatever necessities and luxuries she will demand, Gora in turn will permit our miners to take out precious metals from her unused mines. Airships will henceforth fly between Tabora and Gora. Educators, architects, and various workers will go into Gora to aid her in building up her country. Agriculturalists will study conditions there and do what they can to revive her barren soil. Yes, a brotherhood shall be established. And all that, my dear Dana Gleason, is the work of the man you shall mate—Moura-Ur-tor!"

HE allowed her to gather the full import of his words, then he continued: "And as for Richard Dorr . . . I also have a note signed by the Kirada that the Earthling is a renegade, a man who ruthlessly induced the Kirada to consider warring upon Tabora, deluding him into thinking that he could beat Tabora. I already have men searching for this Richard Dorr, and he shall be killed as a conspirator!"

Dana Gleason from the first had doubted Moura's word, as she had learned from experience to doubt him; but she could not submit to hear the last, for she knew that Moura meant what he was saying.

"Moura," she cried, "you wouldn't dare to do that!"

He smiled. "Moura-Ur-tor," he said proudly, "dares whatever he wishes to dare, Dana Gleason. He knows not the word, No!"

"But, Moura, you have been my friend. Won't you be my friend again? Won't you save Richard Dorr for me? You have been my confidant. I have told you everything. Surely you would not be as cruel as to kill the man I love?"

"Perhaps I wouldn't, Dana Gleason—for a consideration."

She understood his implication as she muttered, "Are men the same the universe over?"

"Yes, I sadly fear that they are. Well, is it to be your lover's death or will you be my wife? Speak up, I cannot be kept waiting!"

A sob escaped her throat. "All right, Moura-Ur-tor . . . they are right . . . you always have your own way. Come, I shall go with you immediately."

"Good."

Without another word he led her out, up the stairway to the Corona of Carajama, and into a small office in one of the government buildings. Here, before a magistrate, Dana Gleason swore she was ready to take Moura-Ur-tor to mate.

"It shall be to-morrow night," was Moura's words when he left Dana Gleason. She sat in her atoll with folded hands and downcast eye, while at Moura's command her slave-women were busy getting materials ready to fit her into her wedding dress.

Her first visitor that day was Ubca-tor, who had already heard the news. She confessed to him all that had happened. "By your God, Dana Gleason, if I, myself, have to murder the man who so presumptuously calls himself Ur-tor, I will do so!"

"Hear? The people are rejoicing over the news of the new treaty signed by Kirada Yal, and the news that you are to be wed to Moura. I won't have it! I won't!"

"Who says he won't?" the voice was that of Moura-Ur-tor. "Ah, it is you, my erstwhile friend." And reaching out he gave the tor a cuff that sent him reeling.

Dana Gleason was on her feet, her eyes blazing. "You beast," she muttered between closed teeth. "Be gone. I don't care to see you until to-morrow night, and then perhaps no more. For," she added turning to the youth who had slowly crawled to his feet, "I will declare myself the mate of this man, but henceforth he will have to seek me in Ora!" And again to Moura. "Go, now, go!"

Surprised by the ire he had aroused in the woman, he departed. He laughed to himself when he thought of her threat. She was not done with Moura-Ur-tor yet!

A Lonely Tryst

THAT night Richard Dorr waited hours in the bower for Dana Gleason. He did not know that after Moura had left Dana Gleason fell into a dead swoon from which the slave-women could not arouse her. She lay as if dead, and only by holding a glass over her face were the women able to see that she breathed. Ubca-tor had carried her to a couch, knowing that Moura was the cause of her condition. He had seen him practice the same thing upon slaves.

Dorr had heard the proclamations that day concerning the treaty with Gora, also the one that Moura-Ur-tor and Dana Gleason had avowed their betrothal that day. Of the treaty he had been aware, advising Kirada Yal, on leaving Gora, to accept any terms that the ambassador from Tabora might present to him; but he could not account for the second announcement. Nor for the intended ceremony the following night. Possibly Dana Gleason was wisely playing for time. Yet he could not understand why she did not appear at their trysting place.

Suddenly his heart quickened. Coming toward him was the slender form of Dana Gleason. Only it was not Dana. It was Dure, her slave girl. Breathlessly the girl hastened to tell him all that had happened. She had heard the words that Moura had spoken to Dana Gleason, heard him force her to mate him, else to have her lover die, and she told him what state she was in now.

Dorr swore under his breath. Then he recalled that Dana had spoken of a slave girl who resembled her. This then was the girl. He asked her if she thought she could disguise herself as Dana Gleason, and quickly outlined his plan; for he knew that all the slaves of Tabora were with him and anxious to do his bidding.

"Do you love your mistress enough," he asked, "to die for her, perhaps?"

"Yes, I love Dana Gleason and Richard Dorr enough. And in dying, I can be happy in knowing that you two are saving my people—and mayhap I shall not die"; and she laughed. "No, I do not fear to pit my wits against those of Moura-Ur-tor."

"Is anyone with her now?"

"Only the slave-women and Ubca-tor, who swears that Moura-weit (curse his name) shall never have her. It was through his love for Dana Gleason that Ubca-tor went into Gora to discover if you lived."

"One can be brave for love; a pity that he loves one who is not for him. However, I should be afraid to trust him. I must not be captured."

"I will see if I can send the tor away. Wait here until I return. . . ."

She was back shortly and motioned for the Earthling to approach the house. He found Dana supine upon the couch, her face white and drawn, eyes closed; she

scarcely breathing. He tried such methods as he knew earthly hypnotists to use, slapping her cheeks gently, snapping his fingers and breathing in her face, but to no avail. He could not arouse her.

No one else was about. Dure had sent the other slaves to their quarters, for as her mistress' favorite, she ruled them all. She hurried away to return with a box containing various paints. "We Boatans, as well as the Taborans, paint our bodies and faces when our color is sallow or spotted. Hence I already have the proper paint to make Dana Gleason as golden as I am." So with Dorr's help she applied the paint brush on the face, arms, hands, and feet of the unconscious woman, though first she mixed other paints to the exact shade of the Earthling's complexion. At her direction, Dick rubbed in the oils that gave the right polish to Dana's disguised skin.

WITH that done, Dure proceeded to daub herself. She knew that on the following day they would come to dress her in new garments so that her entire body would need to be painted. She divested herself of the dress that marked her for a slave, and began covering herself with the paint. Abruians have no false modesty for the body, so that she thought nothing of appearing before the man without clothing. He was surprised when that was done to see how much she resembled Dana Gleason. She rouged her lips and applied a dye to her hair, and, but for her eyes of red, she was a twin sister of the Earthling.

Between them they changed Dana Gleason's clothing, dressing her in the slave's garments and redressing Dure in Dana's discarded suit. They were too busy to see that day was already dawning when they at last completed their task. Then Dure ordered Dorr to carry Dana Gleason into another bedroom. He must leave her lying there until the night, when he could come for her and carry her to Gora. Dure did not doubt that Moura's spell would lose its hold in a few more hours. She now prevailed upon Richard Dorr to leave ere he was discovered there. She threw herself upon Dana Gleason's couch, closing her eyes and assuming the same death-like pose.

Richard Dorr was about to leave as he had come, when suddenly retreat was cut off. Moura-Ur-tor had entered the room undetected. He smiled coolly when he recognized in this silver-skinned man the Earthling with his blue eyes.

"Ah, so the prey has come to the hunter, eh?" he remarked jovially. "And how do you like my handiwork, Richard Dorr? I suppose you have been trying to revive her?" he said with a wave of his hand toward the couch.

"Nice of you to come calling this way. It saves my men the work of searching the city for you. I have decided to allow you to be present at the ceremony that will make Dana Gleason and myself mates. And in Tabora, you know, there is no practice of divorce. Once wed, always wed! Nice custom, eh?"

Dorr had nothing to say. He knew that behind him lay the slave-quarters and that he could escape out into the city through them. He had heard much of Moura-Ur-tor, and found he did not like him at all. He hoped that Dure could carry out her part of the contract.

"So Richard Dorr has nothing to tell me, I see," observed Moura with a smile still on his face. "Richard Dorr does not enjoy the prospect of seeing the woman he loves take another man to mate, nor the thought of prison and death!"

At his words, a low laugh now broke from Dorr's lips. "Quite a nice picture that, but believe me I have no idea of carrying out your plans, my villainous friend. And as for your schemes concerning Dana Gleason, I fear you have come into a ringer there." It chagrined Moura that he could not see behind Dorr's inscrutable eyes, for the Earthling had learned early on the planet to withhold his thoughts from another. "As to your marriage to this woman here, you are welcome to her. I have nothing to do with a lifeless thing!"

And he turned away as if contemplating some future course to take. His words, as Dorr expected, aroused a fear in Moura-Ur-tor's mind. Quickly he was at the side of the couch. Concentrating his thoughts upon the figure lying there, he ordered her to awaken. There was no response! And he was surprised to find a blank mind into which he could not delve, facing him.

Reaching down he shook her, only to feel the lifeless, unresponsive body. He half drew her to a sitting position, and her head lolled back, her arms drooped. Dure had understood what was in Dorr's mind, and she reacted accordingly. She would have enjoyed the spectacle of seeing Moura wroth. Now, in consternation, he faced Richard Dorr.

"What have you done to her?"

Dorr shrugged his shoulders. "I have done nothing. I found her that way. I believe she is dead."

"You lie, you inhuman beast. Can you stand there and look with such little concern upon the woman you have professed to love? Is that the temper of your earthly heart? Can you stand there and laugh down upon the woman who has loved you these many months, even though she thought you dead?"

DORR was staring in wonder at the other. He had hated Moura, but now when he saw the look of a broken man in his eyes and heard his voice trembling

With their escort of thirty planes, the party headed for Zoata on a tour of inspection.

with emotion, he felt pity for the man instead of hatred.

"So you do love Dana Gleason, Moura-Ur-tor?" he asked softly.

Moura looked up in surprise. "I love Dana Gleason—I—don't know. I had not thought of her with love in my heart. I have never known love." Then the soft mood forsook him, and he realized his position. Straightening, he got to his feet. "Well, no matter. But you are wrong, Dana Gleason still lives, and you shall see her to-night as she becomes, as you say in your language, my bride!"

Putting a whistle to his lips, Moura blew a blast. At the same time Richard Dorr headed for the doorway to the rear and soon had reached the back entrance of the house. What slaves he met hurried out of his way. They knew who he was and would have protected him with their lives. They did make the attempt, too, when he discovered that the entire house was surrounded by the Ur-tor's guard.

The slaves gathered around him, but he commanded them to stand off, as he did not wish to implicate them in his capture. He was captured and when Dure got up from her couch to watch, she saw Moura leading the way to the palace above.

The slave-women gathered about her and she told all that had happened. Then she hurried to the room in which Dana Gleason lay. She found her with her eyes open, staring about. Moura had attempted to awaken the slave girl who lay disguised as Dana on the couch. In the adjoining bedroom Dana Gleason had heard the summons and opened her eyes. She lay listening to the talk from the other room, and made out something of what was going on there. Wisely she lay still until she made sure that Moura had gone. She understood the fact that Richard Dorr had been apprehended, and tears stood in her eyes. Dure found her silently crying.

Glad to find that Dana had been aroused out of the coma, into which Moura had flung her mind, Dure rapidly told her all that had happened. "Go, call Ubcator. I am sure he will do something to aid us," commanded Dana, and Dure hastened to summon the youth.

He came, surprised at the transformation of Dana Gleason. He avowed he could do nothing to free Richard Dorr, who was now a prisoner of the state, but when the three put their heads together, a plan was concocted.

The sunset was already painting the sky when Moura-Ur-tor came to the atoll of Dana Gleason. He found Dure lying dressed in the magnificent costume that had been prepared for Dana Gleason. He now bent over her and carefully smoothed her brow, spoke to her and called her mind back to the brain-chamber. Dure had carefully been practicing the part that she knew was to come. Slowly she moved her eyelids but took care not to open her eyes wide. She gave a single glance at Moura and turned away her head as she knew Dana Gleason would have done in the same position.

"Come," said the man, "we shall be late!"

A slave-woman standing by spoke for her. "My mistress had not a bit to eat all day, Ur-tor."

Impatiently the man waited until food was brought and eaten, then he slowly led the woman at his side up the broad stairs. The great square before the palace was filled with a thousand guardsmen. The setting sun bathed them in its rosy hues, tinting their flesh and metal accoutrements. The great jeweled door of the palace stood open, and they entered side by side. The Kirada himself joined their hands. The supposed Dana Gleason stood with eyes meekly downcast. Moura-Ur-tor proudly stared about him. His heart was full to overflowing. He was the acknowledged Ur-tor of all Abrui. He had to wife the bravest woman in the land. He had for prisoner the man he hated most vehemently.

Hidden by tapestries that were arranged so that he might see all stood Richard Dorr among his guards. He was slouched against the wall, taking delight in the scene before him. There was nothing downcast in his manner. His guards eyed him warily, doubtful as to what he was, doubtful as to his intentions. Not that Dorr showed he was anxious to make an attempt to escape, but he did have the air of one who knew that he would not be detained overlong by his captors.

The ceremony was over, and Dorr's heart beat wildly, when he realized that Dure, the slave-girl, had played her part letter-perfect. He was anxious to know how Dana fared. Had she been released from her coma? He feared the worst, and he waited impatiently until his guards were ready to lead him back to his prison. Only they did not lead him back immediately.

Before the King

MOURA-UR-TOR had one more trump to play. He was now facing Kirada Kalti, and he was telling him about a spy who had come into their midst. Dorr lifted his eyebrows as he heard himself described as a most despicable character. When he was led before the Kirada, he held his head high and his eyes flashed, but he was able to control himself and told the Kirada he had nothing to give in answer to the accusations. He listened to the long speech Walti made before sentencing the prisoner to death. He was standing within five feet of the dais where Dure sat on the throne chair especially designed for Dana Gleason. He caught the whispered words of the slave. She had been carefully drilled to say the few French words. Her message was, "She waits for you."

With a light heart he was led away to the cells below the palace floor. Moura took his bride by the arm and they embarked in his plane. Moura had planned a honeymoon such as Dana Gleason had described, such as all newly-married couples took on earth. Such a procedure was unknown to Abrui.

In the mountains was a small estate that he had inherited from his family. Here in its seclusion he had planned to bring Dana Gleason and break her to his will. In the privacy of the Cof he took his wife in his arms and embraced her. She lay passive in his arms, and as he looked into her face she opened her eyes wide. They were the red eyes of Dure!

That night was rung the death-knell of Tabora, yet Tabora was unaware. That night was to go down in history as a night of the greatest terror the Taboran world had ever known. It was henceforth to be called the Revolt of the Slaves. There was no bloodshed, only desertion.

At the proper hour all Tabora succumbed to sleep and its great cities lay quiet. Just what happened none was certain, but, at the hour that is midnight, every house gave up its allotment of slaves. Like wraiths they crept forth. Noiselessly every airplane was rolled forth from its hangar, every airship was released from its moorings. What guards there were to object were silenced, each one by a hand on the throat, a gag in

the mouth; hands and feet were then bound together.

There was a rustle like wind in the trees when the planes lifted their wings; their motors were silent, they soared to the heights above the cities. Every metropolis, every city, every village, every hamlet, every plantation, every farmhouse, was silently divested of its wings! The guards and soldiers were not even aroused from their games or their cat naps. People serenely slept and dreamed.

And not until morning did they know what had happened. But the few faithful slaves who remained behind would not speak. The slaves were gone bag and baggage, with every flying machine in the land. And with them had gone Richard Dorr!

Of him his guards had nothing to say. They evinced surprise when they learned that he had disappeared. Had not Ubca-tor, nephew of the Kirada, come and claimed that his majesty wished an audience with the prisoner? True, guards escorted him as far as the ante-room of the palace, but beyond that—was he not in the keeping of the king? Ubca-tor was not to be found.

EVENING found Moura-Ur-tor in Carajama. He arrived on the back of his one remaining slave, the only slave in Tabora who had a kind word for the master. It was a sorry story Moura had to tell. His bride had held him off with a devilish little weapon, the one Dana Gleason always carried with her. She had demonstrated its power to Moura; and Dure had shown him *she* knew how to use it. Then with the company of slaves who maintained his country house and estate she had arisen in the air in Moura's plane, and he had seen the plane head for Gora!

Tabora was in a state of fear, disorganized, fearful of what the next hour was to bring. They blamed Moura-Ur-tor and his treaty with Kirada Yal. Yal had been but stalling for time, waiting for the return of his champion, who had promised to bring the Tabora planes to him, for Gora had no planes. In the streets people shrilled the name of Moura-Ur-tor, whom they now disdainfully called Moura-weit. They hissed, they spat.

Moura called the three Taboran Kiradas together. From Ora had come word that she would have nothing to do with the dealings. She agreed with Richard Dorr that Justice should be done. Give to the Gora the lands that had been wrested from them! Give Moata land to live in!

The Kiradas, with Moura backing them, cried *no!* As rapidly as it could be done, every city was prepared for siege, on every citadel was mounted the great death-ray machines with which they were certain they could wipe out any fleet of planes that should come warring. Old obsolete planes were brought out of hiding. In the airship-workshops thousands of men were put to work to build new airships and complete half-finished ones. A great activity was apparent.

At noon a voice was heard on the new radio of Dana Gleason. It was the voice of Kirada Yal. He explained that Gora was ready to do battle, but first she was giving Tabora a chance to do the sporting thing. The demands of Gora were simple enough. She only wanted her own lands back, the lands occupied at the present by Doata! For Moata she demanded Loata. Gora would be magnanimous. She would not drive Tabora back to the waste lands from out of which she had come. Gora would give Zoata to Tabora for her own, that they might all live together in peace and brotherhood, that they might all have their place in the Sun.

Tabora jeered at such terms. Gora dictating to Tabora! The ropt dictating to the sef (the Abruian lion). However, Tabora was wary enough to say she would consider the terms, and would give her answer two days hence!

Richard Dorr was with Kirada Yal. Everything was in readiness. He understood Tabora's strategy. He knew that Tabora would agree to no terms with Kirada Yal.

For months he had been quietly working for such an end. In Gora he had found the necessary ingredients for gunpowder—saltpeter, charcoal, and sulphur. Small hand-grenades and bombs and shells had been manufactured, crude but efficient enough for their work. Men had been drilled in the practice of throwing them, and of shooting the tiny cannon that could be carried by planes. And these cannon were now distributed among the thousands of Taboran planes now in possession of the slaves. Then after these planes had been painted in the solution that Dorr had manufactured from a formula stolen from Carajama, they were sent throughout Gora to pick up the tribesmen who had already been trained to do their part.

The solution used was the only thing that could render man immune to the power of the Disintegrating Ray of Tabora. Once Doata had warred upon her sister nations, and because all three nations had possessed the same solution, the war had proved futile. Peace had come to Tabora, a peace that lasted many years until it was forgotten that the formula lay in the vaults of Carajama.

Now every piece of metal, every prop, every piece of fabric, every man, was daubed with the solution, so that the entire fleet should be immune to the Ray.

With every fleet of a hundred planes, an airship filled with the officers whom Richard Dorr had created and trained for the work was ready to lead them to battle. Under orders, a hundred of these fleets proceeded to the frontiers of Gora and lay in waiting for the command to descend upon Tabora from every direction. Every plane was provided with one of the new radios, and Dorr had evolved a system of signals by which orders could be despatched without Tabora understanding.

By his side was Dana Gleason, still in her golden disguise; and with her was Dure. Dana was not happy over the thought of this war, but she was beside her lover, and that was all she asked for.

Two days later Tabora radioed her refusal of Kirada Yal's terms, which was the signal for the fleets of Richard Dorr to set out for Tabora. With Kirada Yal, Richard Dorr, Dana Gleason, and a great number of high-ranking officers and statesmen of Gora, in the largest airship that had been captured, set out for Carajama.

The Strange War

THERE is no need to tell what took place on that fateful day. The battle lasted only a day and part of a night before Tabora knew she was beaten. Not an enemy plane fell to the power of the Ureim, while at a signal from the flagship thousands of missiles fell upon the unprotected cities and their environs. Parties landed from the planes, and the Taboran citi-

zens tried to do battle with the Gorans, only to find that they were armed with small metal balls that exploded and caused havoc among the citizenry.

Still no very great damage was done, outside of the killing of thousands of Taborans. A few private dwellings fell, but they could easily be rebuilt. The farmlands were left unscathed. Bombs continued to fall, but they were dropped with no precision and without doing much harm.

At midnight of the same day, the Taborans cried for peace. At Ora the three Kiradas gathered and Kirada Yal and Richard Dorr descended there. Only by his power over his armies had Richard Dorr held the Gorans from completely demolishing all the cities of Tabora, and it was, because of his counsel, that Gora did not claim all the rich lands of the planet.

He drew up the terms of the treaty, which gave to Gora her old country, to Moata half of what she had once possessed, and to Tabora the remaining section sandwiched in between her erstwhile enemies and her erstwhile slaves. Had Dorr been another type of man, he might not have succeeded in gaining his point; but he had made warriors of the Goras, and now he made civilized men of them. Ora approved all that he demanded.

Tabora was given time to evacuate her lands and move into the space allotted her. New cities had to be built to contain her people. Her three Kiradas were forced to divide the lands between them, and over them was placed a regent from Ora. It will take her wounds long to heal.

Moata elected a Kirada for herself, and old national lines were re-established. The golden people are still wildly exuberant over their emancipation, and Gora is overjoyed in the new wealth that has come to her.

Dorr and Dana Gleason stayed at Ora, planning to seek some out-of-the-way plantation where they could henceforth dwell in peace; but Gora and Moata would not hear of it. With one accord they elected Richard Dorr as their Ur-Kirada to see that justice was carried on.

It will take many years, no doubt, to force the three races to live on friendly terms. It will take years for the raw sores to heal; but with a man like Richard Dorr at the head, peace and understanding will grow and mature in the hearts of the people.

* * * * *

AND so our host wearily finished his tale. In his eyes we saw great depth of feeling.

"But what became of Moura?" we all demanded.

He apologized for his omission. "With the defeat of Tabora, Moura disappeared. The Taborans sang a song of hate for him. They forgot what good works he had done and remembered only that he had failed. They remembered him for the ambitious, arrogant man he was. They searched for him, but he was not to be found.

"Only Ubca-tor knew where he had gone to hide with his single faithful servant. In his name Ubca sought out Richard Dorr, and asked for mercy for the man whom his people were seeking in revenge. For Ubca-tor still loved Moura, although he had deliberately set out to save Dana Gleason from the man.

"Dorr sought Moura out, and promised him his aid."

SO the story ended. We were all surprised to discover how stiff and cramped we had become, and arose to our feet to stretch. The golden man appeared again with trays of food and drink, of which we partook with enjoyment. We were all silent as each reviewed in his mind the tale he had just heard. I could not but wonder what had happened to Moura-Ur-tor. Looking up, I saw the eyes of our host upon me.

The Professor broke the tension of the moment. "I wonder," said he softly, "if you would mind telling us your name, sir. Strange that last night none of us thought of introductions," and he smiled blandly upon us all. True none of us had been formally introduced. I did not even know my host's name after traveling half across the world with him. I knew him only as Sa-Dak (good master), and his companion as Tor, which I knew meant prince. It occurred to me that the Taboran had deliberately avoided an introduction and an exchange of names. I saw his eyes travel to his companion as if seeking aid there; then he turned to Rollins. "I swore long ago, sir, that nothing that Professor Rollins should demand of me would I neglect to fulfil. And yet, most of all I dread to disclose my name. But you ask it.

"The man who faces you, sir, is none other than one who has since learned that too much ambition is as bad for the soul as too little ambition. Ambition overshadows one's vision, so that he sees nothing but his aim before him and is willing to sacrifice his fellow man to forward that ambition. I, sir, am Moura-weit."

Somehow, I failed to be shocked at the disclosure, but Professor Rollins dropped the plate he was still holding. Elsie Rollins' eyes widened, and I cannot find words to describe the expression that crept into her face, an expression that was a combination of surprise, distrust, disbelief, disappointment, together with anger and something akin to pity. I could only feel pity.

"Yes," went on Moura-weit, "I am the man who did all in his power to break the will of Dana Gleason and to do away with Richard Dorr. I did not recognize the fact that I loved Dana Gleason. Can you forgive me?"

Professor Rollins slowly answered: "It is not for me to forgive you, for I had almost succeeded in murdering those two. I have lived in sorrow for the deed, but now that you have told me that all is well, I know I can die happy. Wherefore should I judge you? No; rather I am glad you have escaped the wrath of your people and can spend the remainder of your life happy in the thought that you did not accomplish your purpose."

Silently the two clasped hands.

Again a deep silence enveloped us, but I was still anxious for facts. "How did you manage to construct this machine and escape, since men were seeking for you?" I asked.

Moura-weit turned his strange eyes upon me. "That I owe to three people: Richard Dorr, Dana Gleason, and—Ubca-tor," and he held out his hand to his companion in exile. "I have spoken of the machine which the Roata (the Earth-club), commenced to build, hoping to gain favor in Dana Gleason's eyes. It was abandoned at Ora when half completed. Dorr gave me help to complete it. Then Ubca-tor and my faithful servant Urto elected to accompany me. Richard Dorr and Dana Gleason saw us depart and wished us God-speed. On leaving, Dana Gleason, whom you would now call Mrs.

Richard Dorr, presented me with the manuscript I brought to the Professor, and she also gave me the little diary as a memento; for she said she no longer needed it, since the past was past, and she thought it would aid me in convincing the Professor that she had truly sent me to him!"

There was much more said, but that is irrelevant to this story. Moura-weit conveyed me back to the spot where he had first captured me, but the Rollinses went back with Moura-weit, for the Professor was anxious to see the Void.

Professor Rollins died aboard the *Yodverl,* but what Elsie Rollins experienced aboard the interplanetary vehicle is another story. She returned only to straighten out the effects of the late Professor Ezra Rollins. She came to New York and stayed long enough to help me compile the above story, which will not be published until I am dead. Perhaps after I die, Moura-weit may return to Earth and so corroborate this exceptional history.

Doctors have examined my collar bone, but can find no proof that it was ever fractured. My wife refuses to believe a word of what I told her, declaring I must have hidden away a cache of whiskey in my fishing-hut, and drunk too deeply. I have only the ruby that Moura-weit left in payment for my old suit. Gem experts declare it to be as perfect a ruby as ever was found and insist it is of terrestrial origin. I know differently. But—I cannot prove it.

THE END

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.

ALMOST AN INTERPLANETARY STORY

Editor, AMAZING STORIES:

I trust you will not consider this letter an intrusion or anything but friendly criticism. Have been reading your most interesting publication, AMAZING STORIES, almost from the first issue. And will say it is O. K. nothing else but.

Best of all are some of the astralnautic stories. Some are very good indeed, with the exception of the means of transit, as conceived by some of the authors. At this time it is the rocket craze, an idea as old as the themes of the authors. I once read your answer to a rocket idea about a suggestion of it acting as a satellite to the Moon. Your answer was that it might get too close to Luna and collide with a telegraph pole, or am I mistaken? Was it Prof. Münchhausen's aerial tower? I think that was a good answer to the suggestion.

But on the level, do you really think this rocket to the Moon or Mars has any kind of a show? As I am an advertising man, I can readily see your stand. If the public wants a rocket to Mars or the Moon—all well and good, give it to them, even if Jules Verne did tell about it years ago. BUT in reality this might not be so good. Suppose Prof. Goddard really thinks it possible. You still have doubts as a good business man must have them. The chances are ten thousand to one that one could never even get out of the attraction of the earth. For one reason the Moon is possibly held partly in position by the gravity of the earth. And the Moon is a long, long way from the earth indeed. Besides this is only the simplest and most childish way of trying to get out of our earth's attraction. Your Interstellar machine was to my mind a great idea. The globe system. Because all astral bodies are this shape, with the exception of meteors. But to build a machine or contrivance is a big thing indeed. Could metals, as we know them, be considered at all? Not on account of their relation to gravity, but their ability to stand expansion and contraction. Also would they have strength enough to withstand a possible collision with a giant meteor until you could get far enough from the earth's attraction to neutralize this hazard. Then these rovers of space might collect so thick around the hull of the space machine that they would put you entirely out of commission. Then steering a rocket would be all humbug with the counteracting charges, etc. Suppose we do reach the Moon, which eventually will come some day. Let us hope, my friend, that you and I will see that day and listen and see the movies over the super vision-phones of the reports.

When that day arrives, man will be great indeed, at least in our solar system, unless life gets so unbearable on Mars that the Martians will migrate to our planet. Who knows? For you have no doubt read the lines of the poet, "and 'tis written in the stars, there are other worlds, other lives, other happiness than ours." But let's hope that the Martians will stay on Mars and not beat us to it.

Suppose a giant globe is built of aluminum treated to stand extreme low temperatures. Say three thousand feet in diameter with a globe to withstand extreme low temperatures as well as high ones. This outer shell to be a maze of buffers, aluminum discs with plunger bar running to the cylinders inside the shell with a plunger. Cylinders to be filled with highly compressed helium gas (*or perhaps a new gas that is now about perfected in Germany that has as I understand from twelve to twenty times the lifting power of any gas now known*). The cylinders would act as the gas bags and dash pots for the meteor buffers. Also the cylinders of very thin sheet rolled aluminum would give you enormous strength when riveted to the outside shell. Then another gigantic cylinder inside the first, with a space filled entirely with the very highly compressed gas, separating the two globes, thus making the inner globe like a toy balloon of monster size floating free in the gaseous atmosphere of high pressure.

Of course there would be a passage made flexible or passages from the inside of the sphere to the outside shell for observation purposes, etc., as well as the propulsion tubes. The propulsion tubes to be used after we get out of the earth's attraction. (Remember a million miles on a gallon of gas!) A good way to express that little power would be needed to move after we get away from earth. It is here calculated that the lifting gas will carry us up about twelve miles. Then the rocket explosion system using our lifting gas to drive us still higher. Understand there are millions of cubic feet of this gas compressed into our cylinders, as well as the compressed gas space of eight hundred feet between the two globes, the inner globe and the outer globe, making in all many million more cubic feet.

Of course the central part of the inner globe will carry our electrical machinery, oxygen outfits, portable oxygen outfits, chemicals, food, clothing, water, and numerous scientific instruments, etc., etc., heating plant, cooling plant, etc.

Again we think of Jules Verne and the passengers in his rocket standing on their heads and floating about, etc. You wear laminated iron shoes that keep you on an even keel, held down by the powerful magnets in the center of the globe's machinery. Inside of globe is constructed so that your feet are always pointing to the center, just as they are on earth.

Atmospheric pressure will keep the vital organs of the body in their proper position, perhaps even better than earthly gravity. This is artificial atmosphere made by our machinery and its auxiliaries.

The take-off from earth after the powerful lifting gas has been compressed into our cylinders will be made by a mechanical device, securely anchored to the earth.

Steering the giant globe, after we get out of the earth's attraction, will be made by the aid of the propulsion tubes. It is well to ask here just how does Prof. Goddard intend to fire his tubes without oxygen? In his measly little rocket, that is utterly impossible. I would like to hear your view on this point.

As the gravity on the moon is much more feeble than on our earth, and as we are almost sure there is little or no atmosphere, we shall depend entirely on our propulsion tubes for the return from the moon, having over half of our gas left when arriving on the moon's surface.

The voyage through space may indeed be quite interesting. For instance, why not? *The Sargasso Sea of Space.* How about a good tale in AMAZING STORIES on this theme. On the voyage to the moon, one might possibly run into such a sea, a sea of dying satellites lost from their mother planets, and a sight that you will remember to the last day you live.

It was a tiny satellite composed of a sulphur color mass, about the size of an eight-acre field in diameter. This satellite was bobbing gently and clinging to a much larger sphere alongside of it. As you stand in the end of the observation tunnel next to it as the space machine slides past, you phone to the engineers to hover, hold position.

A sight that mortal man in his wildest dreams in the world of fancy never expected to see. Clinging to this satellite in the *Sargasso Sea of Space.* An airplane of the triplane type. The pilot with his head hanging over the cockpit with his helmet and goggles still in place. A red triplane with two Spandau machine guns mounted. Plainly the Maltese cross painted on the tail could be seen. Then it dawned on me, as I remember well over seas when the report was out that they had "got" Ritchoven. All liars, they could not get the bravest and most skilful pilot that ever flew a plane.

Only this explanation; this tiny satellite, wandering around mother earth, had for years been quite close to us, but had never been discovered. And because of its unknown composition refused to

(*Continued on page* 568)

In the Realm of Books

Mostly Scientific Fiction

An Anthology of Best Weird Stories

The Great Weird Stories. *Edited by Arthur Neale. Published by Duffield & Co., New York City. $2.00.*

In the mad rush of present-day existence, our tastes in reading matter seem to have taken on all the rules of speed. More and more the public seems to have developed a taste for the short story—a story that could be read and finished while waiting for the next course if you happen to be dining alone, or in between acts at the theatre, or perhaps—this seems to be the most popular of them all—just before going to bed.

In this volume of short stories of the weird and ghost-story type, Arthur Neale has chosen rather wisely. Outstanding among his collection are: "The Shining Pyramid," by Arthur Machen; "The Mark of the Beast," by Rudyard Kipling; and "In the Valley of the Sorceress," by Sax Rohmer.

For those who can never get stories gruesome enough, Mr. Neale has chosen "The Two Sisters of Cologne."

Such an anthology as this is extremely timely and the publishers should have no difficulty in getting it accepted by the public. —C. A. B.

Once More the Antediluvians

The Greatest Adventure, by John Taine. *Published by E. P. Dutton & Company, New York. $2.50.*

Ages ago, according to John Taine, there lived a race of people intelligent and overambitious who delved too deeply into the secrets of life. They created enormous monsters, providing some of them with fangs discharging a most virulent poison. This race must have realized the danger these creatures held for the rest of the world once the animals and their fast-growing fauna got loose, so they endeavored to seal up and destroy the results of their science by covering vast valleys with a layer of artificial rock in which they engraved a pictorial record of some of their achievements for posterity to read.

Posterity, in the shape of an adventurous sea captain who has interested a scientist and his daughter, explores and reads some of these records. They have some exciting adventures, perilous flights over ignited gas wells, through miles of gas-lit caverns filled with prehistoric monsters, a battle with a valley full of saurians, the capture of a young saurian and their final escape from the clutches of a fast-growing weed, which grows about a foot a minute.

Conan Doyle in his "Lost World," and recently Allan Sullivan, in his "In the Beginning," have more or less popularized antediluvian animals, and anyone who has enjoyed either or both of these books will be amply rewarded by reading Taine's "The Greatest Adventure." Mr. Taine's splendid imagination has given us quite a number of wonderful books. His "Purple Sapphire" and "Gold Tooth" have not as yet been surpassed by any writer of this type of imaginary fiction.—C. A. B.

READERS' VOTE OF PREFERENCE

Stories I like:	Stories I do not like:
1.....	1.....
2.....	2.....
3.....	3.....
4.....	4.....
Why:	Why:
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be drawn only so far towards our earth. But in its roamings it had drawn many a man and bird to it, holding them prisoner forever, finally drifting onward with this roaming mass of satellites through the heavens, causing a dark spot that blotted out the stars from our earth, and keeping the astronomers guessing.

As we gazed through our powerful glasses I could make out something that looked like a balloon of years ago. Phoning to the engineers again, we moved over to this object that attracted my attention. A balloon it was, with two men in the basket, huddled together as they were when death came. There was a basket with some carrier pigeons within. Then we made out some lettering on the basket, *"Spitzbergen July 1897."* Could it be Andrae and his balloon long forgotten by the people on earth? Numerous birds and odd flying reptiles of long ago were scattered over the satellite. Over to the moon side of the satellite was something we had to wait for, as the engineer in charge of the thermometers advised that it would be necessary for us to cross to the observation port on the opposite side, as the ship must be turned to get away from the terrific heat of the sun as the gas was expanding rapidly on our side. And the chilled side opposite the sun must be warmed. But the wait of an hour was well worth while, for a gigantic dirigible greeted our eyes that did not seem to be damaged in the least. Only the large envelope was deflated, as in the case of the balloon, the gas having escaped out into the great vacuum of space.

We plainly made out the name on the forward gondola, *"Dixmunde,"* and the French flag drooping from under the catwalk. But the most gripping sight of our voyage on the way to the Moon was the other side of this death-dealing sky rover. A gigantic airplane with skull and crossbones under the cockpit—just as they had been painted by the pilots *Nungesser & Coli.* The professor said something to me in a tone that was hardly more than audible. "The greatest experience in life, my friend, is death."

That was all, except a strange helicopter machine. Nothing had we ever seen on earth like it. It seemed to be several windmills with what might be rocket-exploding tubes under the gondola. Hanging out over a ledge was something that seemed to glow and then die down and then glow again like a strange fluctuation in an electrical circuit. This object looked to be about six inches in diameter, disc-like. I felt sure it meant a lot and determined to get it. Putting on one of our portable oxygen helmets, I stepped through the port as the professor opened the door. A hiss issued forth as some of our atmosphere escaped into space and I stepped out on the satellite. The professor closed the door. It was a strange feeling, indeed, to be taken away from your magnetic pull on your shoes, but I was anchored securely to our ship with a strong rope. We took no chances.

It was only a dozen steps or so till I was close to the strange airship and the glowing disc. Watching this disc, it almost seemed to be alive; then it flashed on me that it was some sort of means of communication. As I watched, this is what came to my mind as plain as I can think it of my own free will: We have almost reached our goal—that planet that is so near and yet so far. This machine was the only successful device ever made that could sail off into space. We urged the good ruler on our planet to build many machines such as this and of large dimensions. But it was of no use, always the astronomers told him that the great danger would pass. Towards the last few days of life on our planet we prepared to take off for what you call earth. Here the disc paled and almost went out; it was a pause—I could then draw conclusions This machine had at one time been on the Moon, and built by the Moon men. But what was the great catastrophe that had befallen our satellite when all life died? Here I paused; and as if in answer, the disc glowed with the glow of life.

As the great comet came closer and closer, it was too late to build the airships. The astronomers advised the population to dig great pits, miles wide and a mile or more deep, thus to avoid the breath of the terrible comet that destroyed all life and air on the Moon.

Then it all dawned on me. The craters on the Moon were made by the terror-stricken people when it was the last chance to save their lives. Just as we would do here on earth under the same circumstances. But it failed entirely as the breath of the comet's doom came down on the inhabitants of the Moon. People of the white race, like ourselves.

Well, Mr. Editor, will let you finish this one.

Gordon Lane,
Box 265,
Belle Vernon, Pennsylvania.

(This interesting letter with its many curious conclusions reads almost like a story. But there are several things in it which call for comment. We do not personally believe in the possibility of a rocket reaching the moon. We certainly agree with you that there is no chance that the rocket could ever get out of the attraction of the earth and as you very properly remark, the moon is subject to that attraction. If once the rocket got far enough away the attraction of the earth would be extremely slight and at a greater distance, would practically disappear and the attraction of the moon would take its place. You must remember that not only does the earth attract the moon by gravitation, but the moon attracts the earth. Not only does the earth attract us, who walk upon it, but we attract the earth too. We are not apprehensive of the Martians ever getting either to the earth or to the moon. Your idea of a shell of an interplanetary globe to be made up of a lot of buffers, is quite ingenious. In this connection, the new gas you speak of coming from Germany, is entirely fictitious, for such a gas seems an absolute physical impossibility. Now coming to what you say about Professor Goddard; a rocket is fired without consumption of oxygen. None is needed. So there Professor Goddard is right. Now what follows reads almost like a story. We know that our many readers, who are fond of interplanetary stories particularly, will greatly enjoy your letter.—EDITOR.)

SCIENTIFIC CRITICISM BY AN AUTHOR

Editor, AMAZING STORIES:

I have just read the July issue. I wonder if Jack Barnette will mind if I give him a few facts on bacteriology and surgery? Scientifiction does not give a writer the license to distort or to disregard well established facts in applied science. One of the main functions of scientifiction is to give its readers the correct *atmosphere* of any science. I know nothing about geology, and I want to feel that when I read some geological scientifiction, the scientific *setting* which the author gives me is correct. I do not want to be treated to a lot of his innocent misconceptions on the subject. When a writer sets out to give us a story on some subject that he does not understand, it is his duty to see that every detail he gives us is true to fact; otherwise his story is not scientifiction, but a fairy-tale; and it creates a thoroughly disgusted feeling in those of its readers who happen to be working every day in that particular subject.

I might lead off by suggesting that a bacteriologist would not be apt to have a copy of Paul DeKruiff's *Microbe Hunters* on his desk. This book possibly appeals strongly to the lay reader, but it is not scientific authority, and has found but little favor among scientific men. Your bacteriologist ought to have Park & Williams' *Pathogenic Microorganisms*, or Jordan or Zinsser. Those would furnish him some technical information.

The most incongruous thing was "watching germ cultures through the lens of their microscopes." (I'm sure he meant through the *lenses* of their microscopes.) You cannot watch a culture through a microscope. Before it is possible to see bacteria with a microscope, it is necessary to make a special preparation of them on a slide. In a hanging drop they may be distinguished as bacteria; and if they happen to belong to a mobile variety, their movement can be noted. But they cannot be identified. Some varieties can be identified by killing and staining them. Others again must be cultured on various media, and an identification may require a week's time.

It is not possible to tell by looking through a microscope at a germ, that it has died just at this moment or that. You cannot take its pulse or note the precise moment when it stops kicking its feet. There is no way of telling whether it is still breathing or whether its heart has stopped beating. Even the cessation of activity of a mobile organism does not prove that it is dead.

The only way to check whether or not organisms in a culture have been killed, is by their ability or inability to grow and form *colonies* on a new culture medium. Transplants have to be made from the culture upon which the experiments are being performed; the culture must be put into an incubator, and in a day, or in a week, the results may be read. In the case of tubercle bacilli, three months are required to be certain of results. The statement that "the blood of a guinea-pig showed only dead microbes" is a most ridiculous and mirth-provoking one for a practical bacteriologist. The only way to find microbes in blood is to grow them; hunting for "dead microbes" in blood has got the needle and the haystack skinned so far that there isn't any comparison.

To speak of seeing bacteria "fade and die" doesn't belong in scientific language. It gives the

story a sort of Tennysonian or Hans-Andersonian air; it sounds innocent and guileless; but it isn't scientifiction. When I got through that part of the story I feared that neither Doctor Grey nor the writer had any business monkeying with trypanosomes or spirochetes; they didn't know enough about the subject, and were in danger of getting hurt.

Now a few words about the surgical end of the story. I am not a surgeon, and for that reason have avoided writing surgical stories. I wish the editors could get hold of some man who really does surgery and get him interested in writing stories—that would be real edification for the readers. But I am around surgery every day, and can make some suggestions to Mr. Barnette about amputations. "I can amputate a limb instantly," he says. If he did that, his patient would die of hemorrhage in the next two or three instants. Amputating a limb cuts some large blood vessels; and if the patient's life is to be saved, these must be tied shut *before* the amputation takes place. Furthermore, amputation is not a mere chopping off. Each thing must be done in its proper place and order. The bone must be cut high; muscles must be closed over the lower end of it to form a cushion; enough skin must be left to cover the end of the stump, and so forth.

Mr. Barnette even treats appendectomy too lightly. If he succeeded in crossing his rays within the abdomen and amputating the appendix under cover, the patient would most certainly die, in anywhere between a few hours to four days. If he did not bleed to death, peritonitis would get him, because the open end of the appendix would squirt deadly infection into the peritoneal cavity.

So, I repeat, I think it is wrong for writers to play with subjects they do not understand. It is misleading to readers who read AMAZING STORIES in the hope that they are getting a scientific atmosphere.

I wish to congratulate Lester and Pratt, the authors of "Danger" in the July issue. They have really given the story an excellent biological atmosphere; the little careless conversational expressions of the characters are true to life; scientific men talk just that way. If the writer is careful of his atmosphere, he can put over the wildest kind of imaginative ideas on us, and we swallow them cheerfully.

Miles J. Breuer, M.D.,
Lincoln, Nebraska.

(This letter speaks for itself very plainly and to the point, so we'll have to refer it to the author of the story to which Dr. Breuer takes exception. There are comparatively few who have the happy faculty possessed by Dr. Breuer of writing fiction with exact correctness in minute scientific detail. We think that the criticism on "Microbe Hunters" misses the point of the book, which is indicated in its name. It is a biographical work, not a work on microbes proper and seems to us to be worthy of commendation. If the most incongruous thing in Jack Barnette's story was the use of the singular word lens instead of lenses, we think you would have little to complain of. There is hardly any way of telling what the future will develop in microscopic investigations. As for the instant amputation of limbs. Often instant amputations do occur—by power saws or other machinery—and many of the victims have been known to survive. We are very glad, however, that you did like "Danger," and appreciate your letter and your stories which we publish in our magazine.—EDITOR.)

A SUGGESTED VISIT FROM CLEOPATRA OR SOME OTHER "ANCIENT OF DAYS"

Editor, AMAZING STORIES:

I have been reading your fine magazine for two years and hardly ever miss a copy so I feel that I should tell you what I think of it. One set of my friends condemns me for reading such "impossible, foolish, crazy stories." Then another group of them do not say so much but say that reading stories of that type stimulates the imagination and that there can be no harm in it. But I think many people have a peculiar idea of any one who reads stories which do not deal with present-day facts. But I hate to live forever in the present. I like to take a far journey to some distant planet in fancy, or go into the future on the magic carpet of your stories or be beside some scientist who is conducting some unusual and unheard of experiment. Alas! we cannot all be alike.

I have read much of what others say about your title and cover. For a magazine of your type I don't see how you could choose a better title or name. Likewise you could hardly be less conservative in your cover designs as your stories are not conservative. A demure, modest cover would not match well with stories of the opposite type. I think you combine the two very nicely.

Many of your stories deal with the future, near and distant and the modes of life at those times. I have a suggestion to offer and I wonder why some prolific writer has not thought of it sooner. Why not find some way of bringing some one from the ancient world suddenly into our present day life *via* one of your authors? How would Cleopatra or Nero feel if they were suddenly aroused to life at this day and time? Or perhaps Henry VIII or Napoleon of over a century ago? The wonders of our modern life would be as amazing to them as the wonders of life five centuries hence would be to us, and perhaps even more so, for the ancients had little time to think of the world of the distant future.

I would enjoy such a tale and am sure other readers would. I hope some of your authors will take me up on this suggestion and render us a real thriller. I would try it but am sure some one else could go me one better. So! perhaps Nero or Napoleon will again reappear to live amongst us at least for a few moments to feast their astonished eyes upon the miracles of today.

Ross L. Bralley,
4425 Genesee Street,
Kansas City, Mo.

(We admit that many of our stories may be impossible, but the right kind of impossibility is the basis for the best kind of stories. We certainly do not consider them foolish or crazy. There seems to be so much impending in the near future that it seems a pity that all of us have to leave the world, although we could hope to watch its progress in future ages. You refer to our cover designs; we hope you like our recent covers more. The greatest attention is given them by our Art Director. Your suggestion for a story based on the return of Napoleon or some of the great figures of former days to our civilization is a good one, and we hope that some of our authors will consider the possibility of using it as a subject.—EDITOR.)

AN INTERESTING LETTER FROM A CHEMIST AND PHYSICIST

Editor, AMAZING STORIES:

For several years, I have been an ardent reader of AMAZING STORIES, both the Monthly and the Quarterly. Although I am a chemist and criminologist and read many professional magazines, I find that AMAZING STORIES is as instructive as and far more interesting than many of the professional magazines. I always keep my AMAZING STORIES and have them bound for future reading.

I have, however, a few questions and a few criticisms about some of the stories. In "Out of the Sub-Universe," how did the Professor manage to get his subjects to land on an electron instead of in the interelectronic and intermolecular space? Since he made them diminish as slowly as he did, and since their span of life decreased proportionately to their size, how did they ever live long enough to reach the electron? When the Professor was returning the Electronians to the Earth, would not their increasing weight change the motion of the electron, thus causing a release of atomic power, and destroying all nearby?

Although it is true that there are many similarities between solar and atomic systems, I do not believe that it can be said that they are the same. My reasons are: In the atom, the nucleus is smaller, but of greater density and more powerful than its electrons, while the Sun is larger, more powerful (heat, etc.), but of nearly the same density as the planets. The electrons are all the same size, and travel at the same speed, several traveling on the same orbits (but on opposite sides), whereas no two planets have the same size, speed, or orbits.

In the "Moon of Doom," the author stated that, during a change from a gas to a liquid, or from a liquid to a solid, the electrons (which he compares to planets) come closer together and decrease their speed. I do not believe that is so, but that it is the molecules which do this. If we could change the speed or position of electrons by merely changing the physical condition of the material, we would have solved the mystery of the release of atomic power and transmutation of metals.

I liked the "Menace of Mars" and the "Gasweed" very much, as these stories are the first I have ever read in which the authors never gave their animals or plants (or whatever you may call them) forms too similar to earthly creatures. It does not seem logical to me that evolution would cause the creatures of all the planets to be as nearly like those of earth as most authors depict them.

Although I have studied physics many years, I do not think I have ever understood parts so well or retained so much as I have since reading the "Skylark of Space." I often refer to that story for facts.

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"The Invisible Man" is very interesting, but not so instructing. I wonder if any of the readers know that flesh can be rendered invisible (or rather transparent) by placing it in a liquid having the same refractive index as flesh. Such a liquid is a mixture of three parts of methyl salicylate and one part of benzyl benzoate. Of course, such transparency lasts only while the flesh remains in the mixture.

I have noticed in the Discussions Columns, that many of the readers have difficulty in considering time as a dimension. One reader said it would be as reasonable to call weight a dimension. I think I can explain this by saying all measurements can be classified as first degree measurements, second degree measurements, etc. For instance, since days, hours, ages, etc., are used to measure *length* of time, they are of the first degree. Also, since yards, meters, miles, etc., are measures of *length*, they also are of the first degree. However, since only solid objects, not lines or surfaces, have weight or mass, weight or mass must be of the third degree, not of the first, as is time. This, however, does not say that time or distance need be the fourth dimension any more than the second or fifth. A partial classification of the common measurements is 1st degree, or linear: distance (feet, yards), time (seconds, ages), arc and angles (degree, radian); 2nd degree, or square: surface (square feet), solid angle (spherid, steradian); 3rd degree, or cubic: volume (liters, quarts, cubic inches), mass (grams, tons, pounds), power (watts, horsepower); 4th degree: energy (watt-hours, joule), (a third degree measure × a first); O-th degree: velocity (meter per second, knot), etc.

I enjoyed the story "Into the Fourth Dimension" by Ray Cummings, which was printed several years ago in the "Science and Invention" and wondered if you could reprint it in AMAZING STORIES. I also think that many readers who save and bind the past issues of AMAZING STORIES like myself, would appreciate it if a general table of contents were printed at the beginning of every sixth issue of the Monthly and of every fourth issue of the Quarterly.

Jos. E. Vincent
5108 Dawson St., Seattle, Washington

(Criticism of our stories from a professional man are at once complimentary and instructive. Complimentary because it indicates appreciation from one who is particularly competent. Your criticism of the electron story is so clever that we let it speak for itself. We doubt if the time has come when the planetary theory of the atom as it may be termed can be accepted as absolute truth, for the present theories certainly will be modified in the future. It is quite interesting to formulate various theories about the gaseous, the liquid and the solid states of matter, and surmise whether any atomic change is involved in the physical one, or whether the atoms remain absolutely unchanged in the three states.—EDITOR.)

JUDGING MAGAZINES BY THEIR COVERS. A CURIOUS INCIDENT

Editor, AMAZING STORIES:

I have been a reader of AMAZING STORIES since its inception and as such am much interested in its welfare and am writing the first letter to any magazine to promote just that and not for publication in the "Discussions" column. I wish to state to you some hard facts, but before doing so, I wish to impress upon you that I am writing as a "scientist" of some repute so as to give weight to the facts stated. I have no wish to carry the impression of having an exaggerated ego when I say that I started the study of general science when in "pinafores" and have been at it for fifty years, and am now holding a position of no mean importance with the U. S. government. In my younger days my studies were confined to theory and recreation to "scientific fiction" of that time. As I grew older I was obliged to limit my "fiction" to one quarter of all available "making time," and am still holding to that limit or less, for all of my fiction reading is now confined to AMAZING STORIES. Now, to get to the "facts." As a government employee, I, of necessity, try to secure your magazine from Government building "stands," but am unable to do so. If you do not know it already, the Government leases "newsstand" concessions in its buildings to the best "bidder" under provisions laid down by the controlling department. One, and the only one you are interested in, is that of stipulating which magazines shall not be carried on the stands, and AMAZING STORIES is one of them. This seemed so "amazing" in itself that I took some very valuable time to investigate as to the reason therefor. I went direct to headquarters for an explanation, when "stand" clerks evaded the question, and was informed that the

"cover" proclaimed it as containing "trash" and "sensationalism" and such literature was being suppressed by every means. When I finally proved the facts to be to the contrary, the stand was taken that the cover, nevertheless, gave the impression and that was enough. It is still "taboo" along with "sex" stuff and literature of a religious bigotry trend. Now, as a scientist, I personally care little for illustrations in my fiction, I prefer this type of reading to give its impression from the subject matter and let my own imagination give the "illustration." Your artists are good in a way and I should say by all means to allow them full sway inside the covers, but if you wish to overcome the impression of a great many that the publication is "trash" and also to increase your circulation, I would advise you to make your cover carry the idea of "class" as does the contents. Your name could be changed to some other than that of one of the "Stories" littering the stands now—say "Scientifiction" and this would help again. Your attention is invited to the cover on *Broadcast News* as it first appeared when changed to its present size, class all over.

I am more or less selfish in inditing the above, as I find that I am wishing for greater circulating power and greater prosperity for your "fiction," because I would like a better magazine, if such were possible. You are to be congratulated in publishing a magazine in a class by itself and one filling a long felt want both to the budding scientific mind and to the more mature. I shall read it as "scientific relaxation" no matter if it comes as is or without a cover.

If you desire more information on the main subject, or greater detail, communication to address below will reach me and I shall be pleased to render any service I can to the editor of my one "relaxation."

L. H. Odell,
Box 64, Glen Echo, Md.

(The United States Government might be better employed than ordering a magazine devoted to science of all kinds in fictional stories to be excluded from newsstands under its control, simply because someone who has not read the stories thinks that it is not adapted for the civil service class. We doubt whether a change in name or cover would make any material difference with your headquarters now. However, you will notice there is a change—not only in the covers, but in the general make-up of the magazine. We hope you like the change.—EDITOR.)

SCIENTIFIC PLAUSIBILITY

Editor, AMAZING STORIES:

I have read your magazine for about a year and although I am not a subscriber, I generally manage to get my copy at the newsstand. Having a very wild imagination, I have always appreciated your stories, especially those dealing with mechanics, electro-chemistry, some biology ("Blasphemer's Plateau") and interplanetarian stories. In some of the letters in the "Discussions" Columns I do not always agree with some of the shortsighted people who condemn futuristic stories and ideas as "bunk," etc. In many cases it has been demonstrated that very few things are impossible and people of one age should not condemn the possibilities of the next to their own horizon.

Although I am only a high school boy, I should like to offer a few criticisms as little as they may be worth. First, in the case of the "Revolt of the Atoms," apparently the vortex grew larger in less time during that period when it was first formed and the last moment Flinder saw it larger than at any other time. It grew in the space of an hour or so from an inconceivable dot to the size of a pea, yet as it grew larger, its surface increased very fast. Second, as it was really a sphere of evolved heat, light and electricity, there being little solid matter in it except at the outside edges, why was it tossed about by the wind? In the case of the huge magnets, why did they drive the dynamo with electric motors and the tractors presumably by gas? Of course they could not be run electrically, but if they were, why not use part of the current supply for the magnet without involving a motor generator outfit? This is obviously a trivial matter, but the author ought to have been experienced enough in electrical matters to see this. All the stories are good and it is only occasionally that slight discrepancies are found and a certain amount of these must be conceded or the stories would become dry.

In the story, "Into the Green Prism" the mineral Manahinite certainly possessed extraordinary powers but it was not made clear where the microscopic animals were when reduced. As they were so infinitely small, they might have fallen down a tiny crevice and never been found. It was also not made clear whether the tiny Indians were as small as atoms or not.

Apparently they were not, because they seemed to have solid ground, but their temples and themselves must have been composed of infinitely small atoms and molecules compared to those of the full sized world in which their survivors lived. Just one more question: In a story published some time ago, entitled "The World at Bay," the destroying power of the Troglodytes gas rested on the fact that it shrank the molecules composing any substance, and as a result, human beings or any victims of it were reduced in size and thus distorted. If the prism reduced the Indians, why were they not distorted also? Although it was a good story and well written I did not care for this last because I do not think it sufficiently scientifically plausible.

John D. Larson, Jr.
R. F. D. No. 2, Silverton, Oregon.

(Mr. Verrill's story has awakened considerable criticism. In making it vivid, interesting and pathetic, he seems to have trenched a little upon the accepted views of atomic structure, but you must realize that this same theory is still subject to change in the future and that it is theory and not absolute fact. Mr. Verrill, in a talk with us the other day promised to explain and answer the questions which suggested themselves to readers of his story, in a sequel to "Into the Green Prism."—EDITOR.)

THE LORENTZ-FITZGERALD CONTRACTION

Editor, AMAZING STORIES:

It has often been mentioned that an object traveling with the speed of light, would appear to be going backwards to an observer.

A moving body seems smaller by some degree to an outside observer than it is to an inside observer. The formula for this shortening of the dimension length is $L = l\sqrt{1 - \frac{V^2}{C^2}}$

V standing for velocity of moving object and C standing for velocity of light.

Let us suppose an object travels at the rate of 148,800 miles per second. That object would lose 3/5 of its length to the outside observer.

If an object was traveling 186,000 miles per second, it would have no length. In short it would be two-dimensional. Therefore, how can an object traveling with a velocity of that of light seem to go backwards? And would not an object going at a greater velocity than that of light have a length to a minus degree?

I wish to state that I have read AMAZING STORIES since its start and hope to continue to be a reader of this magazine.

Samuel Greenspan,
13 Suffolk Street,
New York City.

(If we accept the Lorentz-Fitzgerald contraction as true, you will find that if a body moves with the velocity of light, its length will reduce to zero. But if it moves with a greater velocity than that of light, the formula gives it an imaginary quantity, as we have stated elsewhere, so you would get your square root of a minus quantity, something which cannot exist, being what the mathematicians call imaginary. The formula indicates the disappearance of length, so we suppose you may say that an object traveling with the velocity of light would be invisible, from one viewpoint, for it would reduce to a plane of infinite thinness. It might be seen from the front, but looked at edgeways, it certainly would not be visible. It would become two dimensional. The equation gives us quite a bit to think about.—EDITOR.)

A QUESTION ABOUT THE LORENTZ-FITZGERALD CONTRACTION FORMULA

Editor, AMAZING STORIES:

While reading the "Discussions" in the April issue of AMAZING STORIES I came across the formula

$$L \text{ in } M = l\sqrt{1 - \frac{V^2}{C^2}}$$

or the length of a body in motion equals the product of its length at rest by the square root of 1 minus the quotient of the square of its velocity divided by the square of the velocity of light. My question is, should these quantities be reduced to the same units? For example, if the length of the body is given in inches should V and C also be reduced to inches?

George Stehles,
R. D. No. 2, Uniontown, Ohio

(All that is necessary is to express V and C in the same units. If you assume for V a velocity greater than that of light, you will have the square root of a negative quantity—an irrational or imaginary function. This, in a way, under the Lorentz-Fitzgerald contraction law, would operate to limit the maximum of velocity.—EDITOR.)

THE DIABOLICAL DRUG—ELECTRICAL ANÆSTHESIA

Editor, AMAZING STORIES:

I have a comment to make in regard to Mrs. Harris' story, "The Diabolical Drug," which might be of some interest to you. On page 156 of the May issue, Hamilton says, "I have discovered that this pressure, which travels along the nerves to the brain, is very like volts in electricity . . ." To me the interesting thing is that it *has* been definitely proved that the nerve impulses are purely electrical. I do not believe there has been anything published in this connection, but in the research laboratories of the Westinghouse Co., the oscillograph shows these impulses clearly and the varying forms of impulses can be studied closely. In fact a prominent physician has been working with our engineers along these lines and he is now perfecting a system whereby anæsthesia is produced by introducing a counteracting electrical current into the nerves between the brain and the locus of an operation to prevent the pain impulses reaching the brain. This method not only prevents the patient from experiencing any pain, but eliminates the shock effects of an operation since the shock is caused by the strain on the brain due to the pain impulses reaching it, even though the patient might not feel pain due to general anæsthesia by ether or chloroform. With the electrical method there is no shock since the brain does not receive messages of pain, the nerves or "wires" having been blocked off by an equalizing current which counteracts them and prevents their reaching their intended destination.

Please excuse the length of this letter. I could not resist writing because I do not believe that Mrs. Harris knew when she wrote the words quoted, that her character was stating a fact that has actually been proven. Just another instance that "Scientifiction" is not as fantastic and impossible as some of its critics make out. I liked Mrs. Harris' story very much.

H. V. Schoepflin,
867 West 181st Street, Bronx, N. Y.

(Your comment on Mrs. Harris' story is extremely interesting, if we look on anæsthesia as being a temporary death, which of course it is not really. The production of it by electricity comes pretty close to killing a man on the electric chair. Your description is certainly most interesting and gives the subject a purely physical basis, but there is a thing, which undoubtedly exists, called vital force, and we doubt if the Westinghouse engineers will ever succeed in identifying it with electricity.—EDITOR.)

FOSSILS FOUND UPON THE MOON

Editor, AMAZING STORIES:

As a high school pupil, I enjoy AMAZING STORIES a great deal. However, I believe some stories could be criticized.

According to "Moon Strollers," by Ullrich, fossilized fish, crustacea, and shell-fish were found on the bed of a former sea. How did they get on the moon or were they simply evolved parallel to our forms? I believe it impossible for them to have been transported through interstellar space to the moon. It is impossible, in my estimation, that forms would be independently evolved so similar as to have the same general name.

Both land arthropods, such as the spider and insect, and land verterbrates, such as the mammal and bird, were evolved from water dwelling forms. Yet they are very individual. Their means of locomotion are somewhat similar, but their breathing systems and anatomy are very different. Squids, fishes, jelly-fish, and echinoderms live in the sea, yet their anatomy and even means of locomotion are totally different. Therefore even if the original protoplasm was identical, one could not expect to find the same phyla much less the same classes on different worlds. I do believe there would be an animal kingdom and a plant differing from those upon the earth.

"The Gas Weed," by S. A. Coblentz, was very good.

P. S.—I did enjoy "The Moon Strollers," however.

Howard Thiesen.
(No Address Given)

(You must let the writers of fiction have some license—the poets are accorded "poetic license," so imaginative writers should have their special form of allowance. We wonder if it ever occurred to you to ask yourself why evolution produced the minor features of animals, which persist through the centuries. Evolution is a very poor explainer of many things. How did evolution produce the appendix? Why had it not the grace to get us rid of it? Why should we have two eyes and not three? Three, properly placed, would improve the stereoscopy of our vision. The truth is that evolution has not progressed much since the days of Epicurus.—EDITOR.)

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