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Stories by
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AMAZING STORIES

September, 1928

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In Our September Issue:

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Our Cover

This month bears the First Prize Winner in our \$300.00
Scientific Symbol Paper Contest, which closed on May
3rd. Detailed information on the results of the contest
will be found on pages 519, 530 and 521.

In Our Next Issue:

THE MENACE OF MARS, by Clare Winger Harris. Most of our readers will note with pleasure this announcement of a new story by Mrs. Harris. In this tale, the structure of the atom and the analogy of the planetary systems of the universe thereto, and cosmic changes affecting the earth disastrously, are all treated in a most instructive manner. And through it all, in the author's own style, runs a thread of romance.

THE VOYAGE TO KEMPTONIA, by E. M. Scott. Certain irregularities of our moon's motion have led some of our astronomers to believe that there is another body—small, to be sure—between the earth and the moon. Around the idea of this extra-terrestrial body is woven an absorbing tale of unusual interest.

THE ANANIAS GLAND, by W. Alexander. What determines the extent of our truthfulness? It might very well be glandular action of some kind. Mr. Alexander has given us several unusual stories of psychological import, and in this very short story he cleverly works up an idea of extreme interest.

THE SKYLARK OF SPACE, by Edward Elmer Smith, in collaboration with Lee Hawkins Garby. (A serial in 3 parts) Part III. In the concluding chapters of this story, our author confines the travels of the Skylark to their newly discovered planet, the inhabitants of which seemed to have made marvelous strides in mechanical science, but falling short of the advances in atomic theories and chemistry made by the Earth people. Our author tells of truly wonderful devices, and very deftly includes the human interest element.

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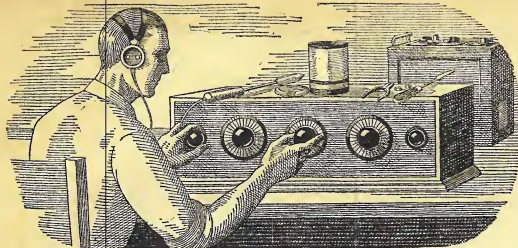
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If all the Radio sets I've "fooded" with in my time were piled on top of each other, they'd reach about halfway to Mars. The trouble with me was that I thought I knew so much about Radio that I really didn't know the first thing. I thought Radio was a dead-end—that was all I could see in it for me.

I Thought Radio Was a Plaything

But Now My Eyes Are Opened, And I'm Making Over \$100 a Week!

For \$50 a week! Man alive, just one year ago a salary that big would have been the height of my ambition.

Twelve months ago I was scripping along on starvation wages, just barely making both ends meet. It was the same old story—a little job, a salary just as small as the job, while I myself had been dragging along in the rut so long I couldn't see over the sides.

If you'd told me a year ago that in twelve months' time I would be making \$100 and more every week in the Radio business—whe! I know I'd have thought you were crazy. But that's the sort of money I'm pulling down right now—and in the future I expect even more. Why only today—

But I'm getting ahead of my story. I was hard up a year ago because I was kidding myself, that's all—not because I had to be. I could have been holding then the same sort of job I'm holding now, if I'd only been wise to myself. If you've fooled around with Radio, but never thought of it as a serious business, maybe you're in just the same boat I was. If so, you'll want to read how my eyes were opened for me.

When broadcasting first became the rage, several years ago, I first began my dabbling with the new art of Radio. I was "nuts" about the subject, like many thousands of other fellows all over the country. And no wonder! There's a fascination—something that grabs hold of a fellow—about twirling a little knob and suddenly listening to a voice speaking a thousand miles away. Twirling it a little more and listening to the mysterious dots and dashes of steamers far at sea. Even today I get a thrill from this strange force. In those days, many times I stayed up almost the whole night trying for DX. Many times I missed supper because I couldn't be dragged away from the latest circuit I was trying out.

I never seemed to get very far with it, though. I used to read the Radio magazines and occasionally a Radio book, but I never understood the subject very clearly, and lots of things I didn't see through at all.

So, up to a year ago, I was just a dabbler—I thought Radio was a plaything. I never

I usually stayed home in the evenings after work, because I didn't make enough money to go out very much. And generally during the evening I'd tinker a little with Radio—a set of my own or some friend's. I even made a little spare change this way, which helped a lot, but I didn't know enough to go very far with such work.

And as for the idea that a splendid Radio job might be mine, if I made a little effort to prepare for it—such an idea never entered my mind. When a friend suggested it to me one year ago, I laughed at him.

"You're kidding me," I said.

"I'm not," he replied. "Take a look at this ad."

He pointed to a page ad in a magazine, an advertisement I've seen many times but just passed up without thinking, never dreaming it applied to me. This time I read the ad carefully. It told of many big opportunities for trained men to succeed in the great new Radio field. With the advertisement was a coupon offering a big free book full of information. I sent the coupon in, and in a few days received a handsome 64-page book, printed in two colors, telling all about the opportunities in the Radio field and how a man can prepare quickly and easily at home to take advantage of these opportunities. Well, it was a revelation to me. I read the book carefully, and when I finished it I made my decision.

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

Since that time I've gone right on up, always under the watchful guidance of my friends at the National Radio Institute. They would have given me just as much help, too, if I had wanted to follow some other line of Radio besides building my own retail

And to think that until that day I sent for their eye-opening book, I'd been wailing "I never had a chance!"

Now I'm making, as I told you before, over \$100 a week. And I know the future holds even more, for Radio is one of the most progressive, fastest-growing businesses in the world today. And it's work that I like—work a man can get interested in.

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

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You will place yourself under no obligation—the book is free, and is gladly sent to any one who wants to know about Radio. Just address J. E. Smith, President, National Radio Institute, Dept. 9A2, Washington, D. C.

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AMAZING STORIES

THE MAGAZINE OF SCIENTIFICTION

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Extravagant Fiction Today Cold Fact Tomorrow

OUR AMAZING UNIVERSE

By HUGO GERNSBACK



F we could imagine for a second that there is such thing as our universe, and then read an account of a number of important facts about it, written like a story by a clever scientific writer, perhaps, instead of by an astronomer, we would probably greet the volume with jeers and disbelief. For truly, if we come right down to it, the actual facts about our universe are so stupendous and altogether unbelievable, that they often tax our credulity.

A great number of scientists today, for instance, will tell you that it seems to be entirely out of the question that creatures like human beings are living on Mars or some other far-away world. These scientists point out that everything is against this, because, they indicate, the chances are not one in a million that the same combinations which have made it possible for a human being to be evolved on this earth could possibly have happened anywhere else. This logic would seem to have a good deal of weight at first, because it does seem impossible that the same conditions and circumstances, coupled with evolution and other factors, could prevail anywhere else. Yet, the self-same scientist will make a spectrum analysis of a star removed maybe a million light years from the earth—a quite unthinkable and unimaginable distance, and he will find that that star is made up of practically the same materials as are found in our own earth. Spectrum analysis has shown us that nearly every celestial body is composed of, roughly, the same elements that we find in the earth. Our own sun has the same elements that are found on earth; copper, iron, silver, with the rest of the metals; oxygen, hydrogen, nitrogen, with the rest of the other gases, are all found on the sun, just as they are found on the earth, and just as they are found on the distant stars billions of trillions of miles distant from this earth. So we are led to believe that the entire universe is very likely one and the same thing. Matter seems to be the same throughout the universe, regardless of distance.

Evidently, the same physical laws also hold good everywhere. We may, therefore, conclude that somewhere in the universe, perhaps not in our own planetarian system, but somewhere else, the same conditions that made it possible for thinking human beings to be evolved on earth, probably made such evolution possible somewhere in the depth of space at some time. Most scientists forget the time element, which is an important factor when it deals with evolution. It may be, that there are not many worlds throughout the universe that maintain human life, as we know it at this particular moment, but in the universe itself, a thousand, a million or a billion years have absolutely no meaning at all. A billion years—a term which we cannot comprehend at all—means nothing in the general universe. It is but a fleeting instant; and the chances are overwhelmingly great that back in infinite time, as well as forward, namely, in future time—the same conditions that were favorable for the creation of intelligent thinking beings on this planet, probably have, or will in the future, manifest themselves again on some other world.

The human mind is constituted on such a peculiar plan, that it is difficult for us to understand or grasp the full meaning of the space-time phenomena. We never can grasp the idea of infinite time nor can we grasp the idea of space, as existing in the universe. Everything is relative. The ant probably cannot comprehend the size of this planet, which is relatively a small body, as celestial bodies go. A bacterium under the microscope, possibly cannot comprehend a greater space than a drop of water which, to him, must already be a great world. And what is true of size, is, of course, also true of time. A minute in the life of a microbe is a

lifetime, and he possibly could not understand such a term as a hundred years. It is, of course, the same with us. We can never comprehend space, due to its tremendous extent; nor can we comprehend the amount of time it would take us to travel even to our nearest star *Alpha Centauri*. This, our nearest star, is four and three-tenths light-years distant from us. Translated into miles, this means 26 trillions of miles. A train traveling at the rate of 100 miles an hour, which is a greater speed than any train on earth now attains, would require about 30 million years to bridge this distance! If we assume the existence of intelligent beings on *Alpha Centauri*; and if we had a radio transmitter and receiver; and if the people on *Alpha Centauri* had the same equipment that could bridge this space, we would have the following strange experience:

We would call up a friend in *Alpha Centauri* on January 1, 1928, and the message traveling by radio—which has the same speed as light, i.e., 186,000 miles a second—would take four years and three-tenths to get to *Alpha Centauri*. It would, therefore, arrive sometime early in 1932. The friend would promptly answer over his radio telephone, and his answer would be received by us sometime in 1936. And remember, this is our nearest star neighbor in space. It is only a little over four short light-years away. The overwhelming greater portion of stars are thousands, hundreds of thousands, and millions of light-years away from us.

Yet, strange and amazing as this may seem, the entire visible universe most likely is a very small speck of matter after all. The chances are, that beyond our visible universe, there may be many other universes, compared to which, our present universe is only an atom. Present-day science tends to show that our universe is probably nothing but a speck of matter itself, and that the stars which give us light may be figuratively termed cosmic electrons.

Our visible universe to some super-creature is probably only a microscopic atom, the same as the sub-atomic world is only a speck of matter to our own scientists. It seems likely, that there is no beginning and no end to the entire universe, either downward or upward. You can go on splitting up a piece of matter until it is so small, that even the finest apparatus can no longer divide it. Yet, that is not at all the end of it. You have not even begun. The same holds true going the other way. It will be found that there are universes within universes, and that there is no end, no matter in what direction you go. The fact is we know very little about such things.

With a speck of radium, and a little zinc-sulphide, we can create an entire universe with blazing suns; but it will be found that some of the physical laws which we have on earth are entirely different elsewhere. We know, for instance, that conditions within our own sun are vastly different from conditions anywhere on earth that we can create by means of heat. The truth is that probably due to gravitational reasons, we cannot create the same conditions on earth as prevail on our luminary. As huge a body as the sun, or the stars, due to the tremendous pressure set up within such a body, gives rise to entirely different phenomena than those which we can create in the laboratory. For instance, no satisfactory explanation has yet been found as to why the sun keeps on going and continues to supply the earth with heat and light, as it has for millions and billions of years. Nor are there visible signs that the sun will slow up very soon. It has only reached its middle life, and is good for many billions of years of service.

Here then, are physical facts that are astounding, and for which we cannot account. It is quite possible that in some super-world, of which we may be a small particle, different conditions prevail, of which we have not the faintest conception.

Mr. Hugo Gernsback speaks every Tuesday at 9.30 P. M. from WRNY (326 meters) and 2XAL (30.91 meters) on various scientific subjects.

The AMBASSADOR from MARS

By Harl Vincent

Author of "The Golden Girl of Munan"

CHAPTER I



It had been a strenuous Saturday for Frank Chandler. When he closed his office door and started for the elevators he breathed a sigh of relief. It was nearly ten in the evening. All week it had been like this—a steady grind, sometimes far into the night. And to what purpose? he asked himself as the swiftly descending car carried him to the street level. He was a successful young architect, yes. But he had missed the fun, the romance, the adventure that his inner being craved. And to-night he was in a rebellious mood. He was sick of pampering his fashionable clientele; sick of the rich old dowager who wanted a special suite for Fifi the Pekingese built into her own boudoir in the new Long Island home; sick of the apoplectic ex-congressman who wanted plans for a residence, part castle-on-the-Rhine and part Turkish mosque. He was sick of himself, of hard work, of everything, as he stepped into lower Broadway from the skyscraper which housed his offices.

The street was practically deserted. A clanging surface car a few blocks uptown and the tooting of a taxi horn around the corner were about the only sounds which greeted his ears. It was hot, oppressively so, for this was New York in August. And Frank wanted to get away from it all.

He strolled toward Battery Park and decided to cool off, if possible, by lounging on one of the benches for a while, something he had not done in years.

Frank was thirty-two, not handsome, but rugged and virile, good to look at. He should have been a man's man but was not. The many friends of his college days had one by one given up in the attempt to get him away from his work and into their social and recreational activities.

Frank loved his work. For eight years he had thought of nothing else. While he had gained a measure of financial independence in that short time, the desire for wealth had not been his incentive. It was the work itself he loved and he now felt that his love had proved false.

He had kept himself in good physical trim by the usual method followed in mid-town bachelor apartment life such as his; a rigid series of indoor calisthenics followed by a brisk walk through Central Park each morning before breakfast.

Now as he sat on the hard wooden bench, he gazed moodily at an elevated train as it made its screeching way around the curve. His life seemed futile. The sultriness depressed him. He wanted to smoke and to think. He was tired, exhausted in mind and body.

Impatiently biting the end from a cigar, he flicked back the cap of his pocket lighter. As he twirled the little wheel, the resulting flare astounded him. It was not the usual flame but an intense green light which grew in size with a hiss until it flamed a foot high, lighting up the park with its weird brilliance. Startled, he tossed the lighter to the grass. When it struck, instead of being extinguished as he expected, it exploded with a terrific roar. The earth shook; his senses reeled. He lost consciousness.

* * *

VOICES in an unknown tongue, followed by the sound of retreating footsteps and the soft closing of a door, brought Frank to the realization that he was still in the land of the living. To his mind there came confused memories of the incident in the park. He did not at once open his eyes but concentrated on the intervening period of time, which to his memory was partly lost, partly filled with vague remembrance. He knew he had been ill, remembered dimly a sweeping rush through space—kind hands ministering to him and aiding him to his present comfortable bed—strange

faces—strange forms—confused voices—unfamiliar medical treatment. But his head was now clear and he knew that the crisis of his illness, whatever its nature, had passed. In fact he seemed to be perfectly well and normal. With this revelation, there came the desire for action. He sat up suddenly and opened his eyes.

He surveyed the surroundings wondering. His bed was in the center of a medium sized room whose walls were bare and windowless. But one door interrupted the smooth symmetry of the walls, which were of highly polished metal of greenish hue. The room was permeated with soft light which emanated from the entire ceiling. Two chairs of peculiar workmanship, a table, and a glass cabinet containing stoppered bottles and surgical instruments, were the only visible furnishings. The air he breathed held an elusive tang of mountain heights, of pine forests.

Hesitatingly, Frank touched the uncarpeted metal floor with his toes, stood up. He had not the slightest sensation of weakness or giddiness. Walking about

HERE is one of the most charming Martian tales that we have printed in a long time. The story is a real scientific jewel and prophetic in many respects.

In this story, the author, for the first time, we believe, shows you how it will be possible in the future to communicate between two planets, providing each has a high intelligence. We are all agreed upon the fact that it is impossible to communicate with dots and dashes, because we have no basis of contact and not even an expert in code would be able to decipher a Martian message if we did get it.

The author has shown a logical way which suggests the possibility of bringing about the desired result. We know you will enjoy this story.



As they watched in silence, Ky-lin entered the room. He walked to the viewing screen and peered intently, waving his hand as a token that he had recognized Frank and could see the company about him.

the room, he discovered that his muscles functioned perfectly. And he had a feeling of being rested and absolutely care free. His body was covered by a long garment made from a coppery-colored silk-like material. But where was he? And what had happened? Seeking the answers, he came upon a push button beside the bed. This he pressed and awaited results.

At his ring there came the sound of hurrying footsteps and the door flew open, revealing to Frank's astonished gaze a huge figure of a man, stripped to the waist, and with skin that glistened with the color of burnished brass. This super-man, for all his strange color, had the dignity of poise and the features of a Greek god. Never had Frank seen such perfection of muscular development. He stared agape.

This imposing and surprising stranger strode into the room with a kindly smile lighting his face, and addressed Frank in perfect English, "Frank Chandler, I am Ky-lin, and it is with great happiness that I observe your complete recovery. You have been extremely ill. Had we known you were on the verge of a breakdown, we should not have kidnapped you as we did. However, it is probably better as it is, since I doubt whether the physicians of Visin would have been able to effect so rapid and entire a cure. I shall not explain in person, but a great surprise awaits you. Please be seated for a moment. I go, but return immediately with one who waits patiently."

Ky-lin left the room with eager quickness while Frank puzzled over the speech he had just heard. Without doubt, his wishes of the park bench had, in some mysterious way, been granted. This was an adventure.

In a very few seconds Ky-lin returned and with him was a tall, blond, youthful-looking chap, at sight of whom Frank let forth a whoop of joy.

"If it isn't Jack Conway!" he cried, "Why—why, Doc, we thought you were dead and buried, or lost at sea or something. Where have you been? Where are we now? H—how—?"

He could speak no more. The two men wrung each other's hands until it seemed they must be crushed. They embraced and capered like school boys, while Ky-lin looked on with beaming countenance.

"All in good time, Chan, old boy," replied his friend. "Just let me catch my breath, will you? And get into your clothes pronto. I won't tell you a thing until you do. Lord, but it's good to see you again."

"Good to see me? What about yourself, you old cowpuncher? I can't get over it yet. Why, it's six years now since you disappeared so mysteriously. Everyone gave you up as a goner, long ago."

"Never mind now, Chan. Get into those clothes and we shall go into executive session. Feel okay?"

"Never felt better in my life. Can't understand it either, Doc. I must have been in bad shape, and it simply can't be very long that I was laid up."

"Three days. And I must tell you it would have been three months under the conditions to which you are accustomed. But here it's different. And still more different where you are going. Boy, wait 'til you hear what you are going to hear and see what you are going

to see. You'll get as big a kick out of it as I did at 483 first."

During this conversation, Frank was busy donning his own clothes, which Ky-lin had brought from somewhere outside the room. Soon he was ready and his old pal led him from the room and down a long corridor. Ky-lin had meanwhile taken his departure and the two young men who had roomed, played, and fought together in their college days, walked arm in arm alone.

FRANK was led into a spacious dining room which reminded him of the first class saloon of an ocean liner. Like the room in which he recovered consciousness, it was walled with the polished metal, windowless, and lighted by the same soft glow from the ceiling. They sat down at a perfectly appointed table and were immediately approached by a waiter, another of the burnished brass giants, but obviously not of the class to which Ky-lin belonged. Frank became more and more mystified as his friend ordered the meal in a foreign and guttural tongue.

"Now we can talk," he began, as the waiter left silently. "First off, I know you would like to know where you are and how you got here. Chan, you may be upset and angry when I tell you, but I believe that when you have the whole story you will be glad. I am talking very seriously now, for it was a serious move on my part to bring you without your consent, and there is a real reason for my action. Please don't be alarmed when I tell you that you are now traveling through the intense cold and complete vacuum of space at a speed of something like 6,250 miles a minute. You are three days away from Visin, the world which I used to, and you still do, call the Earth. In other words, you are about twenty-seven million miles from home. But you shall be returned safely, so don't let that worry you."

The waiter set before them a meal of viands entirely unknown to Frank, and retired. He stared at his friend unbelievably.

"B—but Doc," he stammered, "I—I don't see—"

"Of course you don't, old man," interrupted Jack, "but just hear me out, and keep in mind that what I have to say is of grave import and that I mean every word of it."

"When I have finished, you will not have many questions to ask."

"We are in a space flier, built by the people of Uldur, the planet which on earth is called Mars."

"We are now bound for Uldur, where we shall arrive in another twenty-four hours. Ky-lin, whom you first saw when you awoke, is a Randak—a prince—and is the only son of Ky-mar, the Randanat—the supreme ruler or king of the Neloia, the surface dwellers of Uldur. Chan, I have been on Uldur over two telani, that is to say about six years as time is reckoned on earth. In that time I have grown to love Neloia; their sorrows are mine as are their joys. They are a marvelous race; intellectually, millions of years ahead of our most civilized races on earth; physically most beautiful, as you have observed in Ky-lin. Contrary to the popular superstition on Visin, they are most peaceful

and kind. Of course there are other dwellers on the doomed planet, but these need hardly be considered as a race. We shall speak of them later.

"Three days ago you were kidnapped at my request. How this was accomplished is not entirely clear to me even now, although I was taken from the earth in the same manner. The Neloia are in possession of secrets which would be of incalculable value to the war-like countries of Visin. Forces unknown on our earth and beyond the comprehension of an ordinary medic like myself are controlled by them. How many times have I wished that I had gathered more technical knowledge before coming to Uldur so that I might comprehend better. At any rate, there is a force which the Neloia understand and which was used to bring you from your bench in the park to our space flier, about fifteen miles overhead. Under ordinary circumstances you would have been entirely unharmed. As it happens, you were extremely ill at the time. You may have had some hallucinations at the instant the force acted but it had nothing to do with your illness.

"Fortunately, between Ky-lin's knowledge of the superior healing art of the Neloia and my own meagre medical experience, we were able to cure you in record time. During the three day period, you were also subjected to a number of hypodermic injections which have suited your body for life on Uldur. Changes have taken place in your system which make it possible for you to breathe the rarefied atmosphere and extract from it sufficient oxygen to live normally. Other drugs have altered the relation between your muscular power and weight, so the widely different gravitational effect on Uldur will not be noticeable. In fact, you are now breathing an artificial reproduction of Uldur's atmosphere. The floors in this ship are supplied with energies which simulate the gravity constant of Uldur. Were this not the case you should now be floating in space without apparent weight.

"Our space flier is the size of an ocean liner. It is projectile-shaped, constructed of metal alloys, and is capable of carrying three thousand passengers, though the crew on this trip consists of but six Neloia. The force driving the ship is likewise unexplainable by me, but I do know that it is a reactive force of some sort which propels the flier after the fashion of a huge rocket. However, this force operates without sound or vibration, as you can see from the smooth, silent progress with the enormous speed at which we are traversing space."

Frank had listened in amazement while eating. So sincere was his friend in the discourse that he could not disbelieve; besides there was Ky-lin and the silent efficient bronze waiter to bear out the story. But he felt more as if he were in a strangely empty and quiet hotel than in a ship such as had been portrayed.

"Doc," he said, "it is all away over my head. But if you say it's so, it must be so. I have finished my meal and certainly enjoyed it. I sure was starved. So now take me through this vessel and show me more of its interior. We can talk as we go."

"Just what I was going to suggest, Chan. First we shall visit Ky-lin in his quarters. From him you

will hear further details and a much better explanation of our journey and intentions than I could possibly give. Do you feel all right now?"

"Fit as a fiddle, Doc. But I am burning with curiosity and wish to see and hear more. Strange, but I have no regret at leaving good old mother earth—at least, not yet. I was just about at the end of my rope back there and needed a change and rest badly. Hope my assistant keeps things going properly, though."

"Yes Chan, I knew you were in a bad way, although I did not realize that you were so close to collapse. That is one of the reasons I chose you rather than someone else; that and our old friendship and understanding of each other. But don't worry about that office of yours. You shall see for yourself that all is well and also see how it was possible for me to keep such close track of your movements."

CHAPTER II

THEY had left the saloon and, after passing through a lounge and writing room, mounted a richly carpeted stair which led to a metal door, in the center of which was emblazoned a sort of coat-of-arms. All this seemed like a dream to Frank; the sumptuous furnishings of his new surroundings, the unfamiliar colors of all articles, the strange but delicious food, and the unnatural silence and solemnity which prevailed. It was so mysterious; almost a feeling of supernatural and miraculous power carrying him on without protest or question.

Jack spoke a word in the strange tongue, directing his voice toward a bright disc set into a panel of the metal door. Immediately the door opened and the two entered the quarters of Ky-lin. Here all was as silent as in the larger rooms. They were greeted by Ky-lin with a smile and hearty solicitations as to Frank's appetite and welfare, after which he led them into his sitting room. This was truly a royal suite. The interior betokened luxury and wealth. The commonest of articles appeared to be of gold, and as Frank noted this, he remembered with a start that the entire table service for the meal he had just left had also been of the same precious metal, or of some heavy metal greatly resembling it.

"You two have had a wonderful reunion, I perceive," said Ky-lin, as the three seated themselves in a large room whose furnishings included many mechanisms and instruments. These were apparently for controlling and navigating the ship.

Addressing Frank, Ky-lin continued, "Jack has undoubtedly told you where you are and how you came to be here. I trust that you will forgive us our drastic action in bringing you as we did. Our dear Jack has observed you at your labors on Visin for some time and was convinced that you would not greatly object. Come, I shall demonstrate the manner in which this was accomplished before proceeding with my story."

Frank was led to a small table in the middle of the room. This table was provided with a circular plate, nearly covering the top and made of some material which shone with the blackness of highly polished jet.

Ky-lin manipulated several control levers at the edge of the table, then grasped a knurled adjusting knob which he turned slowly. The luminous ceiling vanished, leaving them in total darkness with the exception of a dim glow from the disc. Peering closely, Frank saw that the disc pictured a portion of the heavens, with one of the planets larger and brighter than the other bodies. Ky-lin directed him to watch this body and, as he complied, the heavens seemed to rush toward him through the medium of the wonderful contrivance.

"This is the Rulgen," spoke Ky-lin, "infinitely more powerful than the largest telescopes of the observatories on Visin. The large orb rushing toward you is Visin itself. In a moment I shall stop the apparatus in order that you may observe your world more closely."

With incredible rapidity the bright orb grew larger and larger until the outlines of the continents of the western hemisphere became distinguishable. Soon the image was fully two feet in diameter and Ky-lin stopped the motion. The sight to Frank was strange beyond compare. In plain relief the North and South American continents were visible, the principal mountain ranges and largest rivers and lakes being easily discerned. The rush of approach was resumed after a moment. Speedily they seemed to be nearing; swifter and swifter became the motion until Frank was seized with vertigo. Just as the impression of being dashed headlong to the earth became acute, the mechanism again halted. Now they were directly over the city of New York apparently at not more than three thousand feet elevation. An identically similar view had once been seen by Frank from an aeroplane, but now the city was stationary, the deep canyons of the financial district just below them.

Again Ky-lin spoke, as Frank watched in awe, "I shall now actuate the penetrating energy which enables us to observe objects within the buildings. Do not be alarmed at the illusion of rapid descent. You shall soon see the interior of your own offices."

As he spoke, the apparent descent re-commenced and Frank grasped the edge of the table to steady his nerves. He recognized his own office building, gasped as the vision seemed to pass through solid masonry and steel girders, cried aloud when the motion ceased, leaving the view in the disc that of his own offices.

This was positively uncanny. Before his eyes he observed the usual rush and bustle of his force; the draftsmen were busy with their lay-outs; the clerks and stenographers were at their appointed tasks; in his own private office Jones was deep in conversation with Mrs. Van Slyke. She smiled and nodded over the blueprints of Fiff's suite. Evidently all was well—Frank had a keen feeling of disappointment for a time. It appeared that his presence was not as vitally necessary as he had thought. There was a click; the luminous ceiling again flooded the room with its soft light. The vision was gone. In a dazed manner, Frank returned to his chair as Ky-lin and Jack laughed over his wonderment.

"Marvelous! Unbelievable!" was his comment when he recovered some measure of equanimity. "Is there anything about science unknown to the Neloia?"

"Yes indeed," was Ky-lin's reply. "Many, many things. If we knew all, we should not have sent for you or for Jack. We now come to the reasons for this, and if you will bear with me for a short period, I shall elucidate.

FOR countless ages the planet Uldur has been dying. The Neloia, who were once a happy and powerful people, have been slowly reduced in numbers and driven to the occupancy of a single city by the gradual disappearing of the water supply and vegetation, as well as by the depredations of the Breggia, the creatures who live beneath the surface of Uldur and who have multiplied rapidly. Food is so scarce on the surface that practically all we consume now is either grown under ground or is a synthetic product. The Breggia, part human, part loathsome beast, have grown so bold and so powerful that soon there will be no more Neloia. Life on the surface will be completely destroyed. The Breggia thrive on the lesser animals which infest the streams and seas beneath. The Neloia now number less than one million, and for all of our scientific knowledge and vastly superior mental power, we are no longer able to cope with the increasing multitudes of underground dwellers.

"Many telani in the past, my people decided to leave Uldur and to take up their abode on another planet. After much thought and investigation, your world was chosen as the most logical destination. But we dared not descend upon Visin unheralded and unwanted. We should have been mistaken for war-like invaders; probably a war would have resulted. The Neloia have nothing but good will for the people of Visin and it is our desire to prepare the way and obtain the approval of the Visinia, as we call your people, before attempting this migration. On your planet there is plenty of food for all, even with the addition of our number, and we are sure that the benefits accruing to your world from the introduction of our advanced scientific achievements will more than make up for the increase in population. But we desire that complete understanding be reached before making the move, and for this reason we brought Jack to us to study conditions for a time, then to return to Visin with the story and with photographic and other evidence.

"Unfortunately, we have been unable to communicate with the Visinia, although we have been attempting this for many telani. We have felt, and Jack has concurred in this belief, that were he now to return alone, his influence would not be sufficient to bring about the desired result. Communication *must* be established and to bring this about we came for you. Our intention is to keep you on Uldur only until such time as we have imparted to you the secret of the Rulgen in its minutest details so that you will be able to return and cause one of the instruments to be constructed for use on Visin. Then communication will become a simple matter. Jack intends to remain with us until all arrangements between the two worlds are consummated. While you and he will not be able to communicate in spoken words, we shall be able to show to the people of Visin, conditions as they exist on

Uldar. Actual communication will be effected by means of the printed rather than the spoken word, since the printed or written page is made distinctly visible in the disc of the Rulgen. Jack has kindly taught your English speech and writing to several of us, including myself. Thus will the problem of carrying on negotiations be solved and thus will your story and that of our dear Jack be substantiated. Possibly the Neloia are over timid, over fearful. But, after viewing the horrible results of the last great conflict of nations on Visin, you can scarcely blame us for using caution. Our mission is one of peaceful colonization and we shall rejoy in many ways, if our welcome is assured. Have I made myself clear?"

"Indeed you have, Ky-lin," Frank answered at once, "I feel certain that it will be possible to carry the desired negotiations to a successful conclusion. But I do have some doubt as to my ability to carry out my own part of the program. My knowledge of machinery and of scientific matters is very slight."

"My dear Frank, you need have no fear on that score," he was assured by Ky-lin. "By a mental impression process known to the Neloia, each detail of the construction and operation of the Rulgen will be so stored in your brain that it will be utterly impossible for a single thing to escape. All metals and chemicals required are obtainable on Visin, although some are rather rare. Certain of your optical instrument builders are sufficiently skilled to construct the apparatus to the specifications to be furnished by you. We anticipate no difficulty in any way. It is most unfortunate that the force which brought you to us acts only on animate objects. Could we use this energy otherwise, it would be a simple matter to deposit a completed Rulgen in one of your observatories after you had made arrangements for its reception. But we know of no energy with which this might be accomplished, nor could we land one of our fliers in a remote spot with the idea of transporting a completed Rulgen to its place of use. The instrument is too delicate to be moved in any way. You will note the extreme weight and rigidity of its support in this ship."

"That is enough for the present, Frank. We shall continue the discussion after we meet my father and the Urdia, his counsellors. In the meanwhile I shall be pleased to show you through this flier, if it is your desire to know more of its construction."

"Ky-lin, you are most kind," Frank answered, "I am in such a state of wonder and amazement that I can scarcely absorb all of this now. And I am deeply interested in this vessel. It hardly seems possible that we are moving."

SEVERAL hours were spent in showing to Frank the innermost compartments of the vessel. At each step, each new explanation, his wonder increased. The only visible mechanisms were those in the control room where the Rulgen was installed. The several energies used for various purposes on board were produced silently in spherical retorts and conducted to their destinations without wires or piping. No moving parts were in evidence. All was so silent, so appar-

ently effortless. Near the stern of the vessel were about twenty of the large metal spheres which produced the propelling energy, the outrushing force which drove the flier through space at tremendous speed. Ky-lin explained that this force was controlled from his own quarters by one of the machines which emitted directing waves of suitable length for the accomplishment of the desired result. The energy which had brought Frank to the ship was similarly controlled, as were the gravity-simulating, heating, and atmosphere producing forces. The vessel itself was a huge space-traversing hotel; the individual staterooms, the crew's quarters, everything giving the impression of one of the palatial ocean liners of Visin, made infinitely more beautiful and comfortable by the unfamiliar furnishings and conveniences. Over all hung the silence like a pall. Frank shivered at thought of the predicament of the Neloia, the people doomed unless help came from his own world.

"Now Frank, old boy," said Jack when they had seen about all there was to be seen, "as your physician I must order you to bed for at least ten hours. You know you were a very sick man and, even though you may feel first rate now, you are actually a convalescent and must get an extra amount of rest. Nothing further to eat until you awake, either. I know that you are excited and all that, but it is absolutely necessary that you do as I say. Am I not right, Ky-lin?"

"What you say is quite true, Jack," Ky-lin responded. "It was inexcusable of me to keep your friend on his feet for so long a time. We shall find a first class stateroom for Frank at once."

Frank started to protest but changed his mind with the realization that he was, in truth, very tired and beginning to feel weak and dizzy. So, without further ado, he permitted them to lead him to bed. Not until he was between the silken sheets did he fully appreciate the wisdom of Jack's order. Ky-lin brought a hypodermic syringe and gave him another injection, for what purpose he did not know or much care. Almost instantly he fell into a deep sleep and his two friends, the old and new, tip-toed from the room and closed the door behind them.

When Frank awoke, it was with a feeling of refreshed vigor and well-being such as he had never before experienced. He sprang from his downy bed with alacrity and jumped for the shower bath which Ky-lin had shown him how to use. The cold bath enlivened him to a degree approaching exuberance and quickly he was dressed, and went in search of his friends. As he had expected, he found them in Ky-lin's quarters. They sat before a circular screen similar to that of the Rulgen. Another of the beautiful bronze giants was at the controls.

"Good morning Frank. How do you feel now?" spoke Ky-lin and Jack as one voice.

"Fine, thanks. Both of you. How long have I slept?"

Ky-lin laughed. "Just about fifteen hours," he replied, "but observe the screen before you. See where we are."

On the screen, like a panoramic motion picture, was

presented the rugged contour of a weird country, over which they were passing at moderate speed. The landscape was seamed and scarred; bare; arid. Towering crags, of coppery hue, seemed about to crumble and fall. River beds and canals, long since dry, exposed strata of vari-colored rock—colors foreign to nature on earth. Not a sign of life or of vegetation was in evidence. Ruins of habitations which had once been pretentious in size and architectural beauty appeared here and there. Long unused roads, which had in past ages been smooth and heavily traveled, were now broken and twisted by the sub-surface convulsions of a planet in its death throes. Soon they approached the ruins of a large city, passed directly over it. This city had been walled, and still showed signs of a former high degree of organized civilization. Outlines of public squares, ruins of tall skyscrapers similar to those on earth, still remained. Some of the stone among the ruins gleamed with the myriad hues of mother-of-pearl. Over everything brooded the mystery of ages. The winds whipped up and sent into swirling clouds the dust of decay.

Now they were over the bed of a former sea, dry as the ruins they had just left. Fissures in what had once been the bottom of a large body of water emitted vapors, vicious and searing, some blue as the flame of a blast lamp, some yellow and sulphurous. Ahead in the distance could be seen a mountainous coast. Ky-lin explained that Ulderg, the city of the Neloia, lay just beyond the range of hills and that they would be there in less than a half arg, or about twenty minutes, as time is reckoned on earth.

The time passed quickly and soon the mountain range was crossed. A greatly different scene was presented to view. A great valley spread before them, blue-green with vegetation, scattered and stunted, yet alive. Networks of irrigating canals stretched as far as the eye could follow and patches of partly cultivated ground made a checkerboard of the landscape. At the horizon, directly ahead, clouds of blue vapor eddied and drifted. With a momentary clearing away of the vapors a second range of mountains became visible only a few miles away. To the left, almost in the center of the valley rose a lone peak, flat-topped. On the plateau thus formed was seen the city of the Neloia, a cluster of tall buildings arranged with mathematical precision to provide roadways between. Each building glinted in the sunlight with the reds, blues, and purples of carborundum crystals. Evidently they were constructed from a material fused in the crucibles of nature in the interior of the strange planet. The bizarre appearance of the city was further heightened by the hemispherical domes that topped all of the buildings. These shimmered and scintillated in the semi-sunlight with the yellow of pure gold.

A central open space surrounded a structure much larger than the others, likewise covered by an immense dome. But this building was opal white from the ground up and was decorated with spires and minarets, as were none of the other habitations. Ky-lin uttered a word of command to the mute figure at the controls and the speed of the vessel slackened as they approached

the central square of the city. When the ship was directly overhead, all motion ceased and they hovered high above the glistening dome of the white edifice. Ky-lin explained that this was the palace of his father, the Randemat, and that it was to be Frank's home during his stay, as it had been Jack's.

The square was crowded with Neloia, as were the radiating streets. All faces beneath them were turned skyward and great excitement seemed to prevail. As the vessel settled slowly toward the surface, the crowd drew back from the palace, leaving a clear rectangular space some seven hundred feet long and two hundred wide. In this space there appeared a large opening as a section of the pavement swung back into the cavity beneath. The flier dropped into this opening and on the screen the view changed to that of a huge underground shipyard, where nine more of the machines rested in their cradles. Slowly the vessel carrying our two Visinia dropped into the one empty cradle and came to rest without the slightest shock.

Frank followed Ky-lin and Jack to the disembarking platform with eager anticipation. All three were excited and expectant. The immense gathering for their welcome betokened something out of the ordinary. The Randak gravely remarked that some occurrence of importance must have taken place during his absence to account for the unusual demonstration.

CHAPTER III

THEY were greeted at the landing platform by three of the Neloia, who engaged Ky-lin and Jack in rapid and excited conversation in their own tongue. These were obviously Neloia of high degree, since they conversed with Ky-lin on a basis of close understanding. Their garb consisted of short tunics of cloth of gold, bound about the waist with heavy cords of white. Ky-lin had donned a similar garment before leaving the ship. These were certainly a handsome people, thought Frank, as he watched the expressions of the faces while the animated discourse continued. The color of the skin did not detract in the slightest degree from the classic beauty of body and head. All had curly black hair, close cropped, and intense black eyes, which somehow held an expression of combined joy and sorrow, of peace mingled with fear. Ky-lin received the news, whatever it was, with extreme gravity and concern, and the six hastened over a long runway toward a point underneath the palace. As the pace quickened almost to a run, Jack dropped behind and explained to Frank that a serious misfortune had excited the populace and that they had been waiting in the streets for hours for the return of Ky-lin, who was greatly loved and trusted by all.

It seemed that one of the four sources of water supply had been closed off by a sub-surface tremor of great magnitude and that several hundred workers had been entombed at the same time. The water supply, Jack stated, consisted of four large underground lakes, which were originally of great depth but had been gradually lowering in level due to the demands of the Neloia, until it was becoming a matter of grave concern as to how long a time the supply could be expected

to hold out. Now with the loss of one-fourth the number of reservoirs the matter was really one to cause trouble. With the burying of the lake and of several hundred Neloia there had also been destroyed one of the pumping and purification plants, and as each of these had only a definite daily capacity the populace already found it necessary to curtail their use of the precious liquid. The surface irrigation would have to be abandoned and all food obtained from under ground.

To aggravate matters further Ky-mar was dangerously ill. The public had not been notified of this, since the Urdia feared the result of heaping an added worry on the heads of the people. Ky-lin was much upset over the whole affair and wished to see his father immediately. The Urdia, however, felt that it would be best for him to first appear before the assembled multitude to quiet and reassure them.

They had now reached the base of an elevator shaft similar to those in the large buildings on earth. One of the Urdia directed his voice toward the little bright disc which was set into the wall adjacent to the shaft. The car appeared at once and as the passengers entered, it arose swiftly and silently at another word of command uttered by Ky-lin, who had stationed himself at the disc in the side wall of the sage. At the halting of the lift the six emerged upon a balcony which overlooked the public square, packed with a dense crowd of milling, gesticulating Neloia. When Ky-lin appeared, there arose a great shout of welcome. "Akra, akra, Randak!" Frank made out as the salute to their prince.

Ky-lin raised his hand in a dignified gesture of command and the crowd was stilled. Where, but a moment before, pandemonium had reigned, all was now as quiet as if the streets were deserted instead of packed to overflowing. A highly-polished crystal sphere was placed on the balcony railing before the Randak, and when he commenced speaking in a rather quiet tone of voice, his speech was amplified to the magnitude of a sonorous but distinct thundering, which rolled forth over the square and its surrounding streets like the benediction of a deity. This reminded Frank of the public address systems in use on earth but was infinitely more powerful and true to tone. The voice came from nowhere in particular; it permeated the consciousness of the listener as if generated in his own brain.

The words of Ky-lin's speech were so much jargon to Frank, but it was apparent from the pleased looks of the Urdia and from the reactions of the crowd, that the desired result was effected. When he finished, a great roar came up from the assembly and immediately they commenced to disperse, the Neloia streaming from the square and into the side streets in orderly quiet. Jack whispered that Ky-lin had used the bringing of the second visitor from Visin as a means of encouraging and reassuring his people, telling them that negotiations with the distant planet were already on the way to a quick and successful conclusion. He had ascribed almost superhuman virtues and influence on his own earth to the new visitor. Frank chilled inwardly at thought of what would now be expected of him by this remarkable people, and wondered hopelessly how any action of his own could possibly bring about results that

would justify the hopes that were now placed in him.

Ky-lin and the three Urdia hurried to Ky-mar's bedside with the two Visinia a few steps behind. Frank was impressed more and more with the ancient grandeur of his surroundings. The rooms through which they passed were spacious and high-ceilinged, decorated with splendor seldom seen on earth. Everywhere were articles and fittings of gold. He was later to learn that gold was actually used in its pure form by the Neloia and was valued solely for its beauty of color, since it was one of the commonest of metals to be found in the mines of Uldur.

In reverence Ky-lin and the counsellors approached the canopied bed wherein reposed the figure of the Randak. Propped up on silken pillows in the midst of untold luxury lay the aged ruler. At his bedside knelt a girl sobbing as the hand of the obviously dying monarch stroked her glossy black hair. Standing at the opposite side of the bed were two court physicians and both shook their heads gravely as they were greeted by Ky-lin, who neared the death bed alone and in silence. Strangely enough, the dying words of Ky-mar were in precise English, painfully enunciated. The Randak knelt beside the girl with his arm thrown over her quivering shoulders. The keen blue eyes of the old man softened in tenderness, a kindly smile illuminating his rugged bronze features. The magnificent head, surmounted by a crinkled mass of snowy white hair lay immovable on the pillow. The single hand outside the coverlet, once strong and sure, now wandered aimlessly, alternately stroking the head of the sobbing girl and fluttering toward the free hand of Ky-lin. Unashamed, Ky-lin looked up with great tears coursing down his ruddy cheeks and listened intently as the last words of his father were spoken, almost inaudibly.

"Beloved children," he gasped, "weep not at my passing. Think rather on the future, the glorious task before you of perpetuating the race of the Neloia, of delivering them from the fears and horrors of existence on poor ancient Uldur. Ky-lea, I leave you in the care of your dear brother Ky-lin, as I do all of my dear people. Ky-lin, I have every confidence in your ability to carry on with our plans and to wisely, lovingly guide and protect your people. My sight fails, but I believe that you have brought with you the friend of our dear Jack. Call both of our visitors to me, that I may look upon their countenances and pass into the unknown with assurance that all is well."

Frank now found that he too could not hold back the flow of tears. It seemed that he was losing an old and extremely dear friend of his own. As he and Jack approached, the girl Ky-lea arose weakly and rushed into the extended arms of Jack, burying her head on his shoulder. Again Ky-mar beamed and gave the two his blessing. This was a revelation to Frank; he had not harbored the slightest idea of anything of the sort in connection with his old pal, who had never interested himself in the opposite sex at all in their younger days.

"Draw near to me, Frank," requested the dying man, "that I may see with my own eyes, that what I have been told of you is true."

Frank complied, and gazed sorrowfully into the intense, but now glazing eyes of the Randanat. Ky-mar regarded him earnestly; then smiled in contentment and closed his eyes. They thought that the great soul had passed, but again he spoke with a last painful effort:

"I am content. I go, but I shall watch over you all from that plane where dwell the spirits of our fathers. Be brave and faithful, my children. Mourn not, but carry on with renewed strength. My gratitude to you two, dear Visinia, knows no bounds. You and your people shall be richly rewarded for receiving the remnants of my once happy and powerful Neloia. Farewell, all. Farewell."

With the satisfied smile still on the face of the deserted body, the spirit of Ky-mar left to join those of his forefathers. The emotions of those in the room were unrestrained for a time. As the physicians carefully covered the still features, the Urdia stood with bowed heads, Jack comforted Ky-lea as best he could with his own heart full of sorrow, Ky-lin stood with arms folded over his deep chest and with eyes that stared unseeing into the great beyond through a film of tears. Frank, with a great lump in his throat, looked on helplessly.

CHAPTER IV

THE succeeding days were busy ones indeed. Frank was accepted by the Urdia and other members of the court, as if he were an equal and had always been among them. He was taken to one of the mental impression laboratories and in a few hours had been given the complete language of the Neloia, never to be forgotten. The news of Ky-mar's death was received in deep sorrow by his subjects and the burial rites which followed were touching in the extreme. These were an emotional and sympathetic people. They had obviously loved the Randanat as no ruler on Visin had ever been loved by his subjects.

The beauty and stateness of the Neloia impressed Frank more and more as he came to know them better. The men were of magnificent physique, averaging well over six feet in height, but of the kindest and most understanding disposition. Their striking beauty of form and feature was accentuated rather than marred by the color of the skin. The women were marvelous, smaller in stature and with exquisitely modeled bodies revealed by the filmy garments they wore; much lighter in color than the males, their skin was of smooth peach-like texture. Brilliant black hair was piled high on their heads in soft fluffiness of arrangement. Large, bright, intelligent eyes looking forth with that indefinable expression of mingled hope and sorrow, made them the most appealing beauties it had ever been Frank's good fortune to come into contact with. Of these, Ky-lea was by far the most beautiful, and Frank told his friend again and again of his good fortune in having won for himself so glorious a woman.

The succession of Ky-lin to the throne and title of his father was symbolized with little pomp and ceremony. At an assembly of the Urdia and the most important personages among the Neloia, he was presented

with the emblem of his sovereignty, a golden sceptre of curious design, which was placed in his hand by one of the Urdia with a simple speech outlining the laws of succession as handed down through the generations of their ancestors. This ceremony was held in the large Urdesil or throne room of the palace, not more than five hundred Neloia being present. Frank learned afterward that practically all of the population actually attended the ceremony in the privacy of their homes, in the mines, laboratories, workshops, wherever they might be, through the Tesk, that most perfected of instruments which brought the speech and movements of the entire scene to them in faithful reproduction.

The Neloia returned to their normal mode of living and to their regular appointed tasks. With the exception of the curtailment of the water supply all was as it had been previously. The faith and trust in the new Randanat was complete.

Meanwhile Frank learned much of the past history and existing conditions of Uldur. He was assigned to a suite of rooms in the palace adjoining those of Jack, and the two were constant companions, often joined by the beautiful Ky-lea. He learned of the underground operations of the Neloia, the filtration and distillation of the scanty water supply, the mining of metals and minerals required by them, the cultivation of certain vegetable life which thrived only in the dampness far beneath Ulderg.

He learned of the Breggia, the loathsome creatures who were the product of their underground environment, through ages of living near the sub-surface sea, where their ancestors, who had originally been Neloia, had fled in terror during an ancient period of quakes, landslides and other widespread surface disturbances which had, at one fell swoop, killed off half of the inhabitants of the planet. These creatures had degenerated through eons of time into amphibian monsters, retaining some of the features and brain capacity of the Neloia, but with bodies of reptiles and with eyes that could see only in darkness. Carnivorous they were, of necessity, feeding upon the fish and other creatures that abounded in the inner recesses of their realm. The Neloia feared them not in sunlight, but in darkness the raids of the Breggia were frequent and sometimes of serious consequence in the number of Neloia killed and in the destruction of considerable areas of the farm lands in the valley surrounding the city. Their realm was in no wise connected with the underground workings of the Neloia, but a constant dread of the Breggia finding a means of tunneling through or of the forces of nature opening passages to their stronghold filled the minds of the harassed people.

The city of Ulderg was constructed on the plateau for safety from the marauders, but during the past generation they had found means of scaling the sheer cliffs and occasional sorties had netted the Breggia numbers of the inhabitants, who had been carried away, screaming, to horrible deaths and ultimate consumption by their enemies, as delicacies of food. The dwelling places of Ulderg were impregnable and the Breggia always left before dawn, but the Neloia were never sure whether they dared venture from their abodes after

nightfall or not. It was an indescribable reign of terror.

Each day Frank spent considerable time in one of the mental impression laboratories, having the mysteries of the Rutgen implanted in his mind. Part of this acquisition of scientific knowledge was by his conscious mind, but most of the intricate details were indelibly left in his subconscious mind by a process of thought transference, accomplished while he was in the trance—which was his daily experience. It was necessary to convey the information piecemeal, since the human body and brain could not long endure the process without rest from the strain. Very little of mechanical aid was required by the Neloia who had this in charge. After a moment of subjection to the orange rays from some light-producing device, Frank would lose consciousness, and the Neloia would proceed with the dismantling of portions of the Rutgen, giving to Frank in his state of coma a detailed description of each minute part, including dimensions, materials of construction, and the functioning of that particular part in the assembled whole. When Frank left each day, after this experience, he found that he had no recollection of what had transpired and he anxiously told his instructors of this. This, they advised him, was the natural course of events. The material was entirely stored in his subconscious mind, he was assured, and would not be released to his conscious mind until all data was completely impressed. Then he should be able to transfer the instructions like blueprints and printed description from the unsuspected storehouse of a certain portion of his brain. This was all very astonishing to Frank and he had some doubts as to whether the process was taking effect, even though it had been successful in the case of the language of the Neloia.

ONE evening, as Jack and Frank were dining with Ky-lin and the charming princess, who was to be Jack's bride, a shrill wail smote the night air, rising in swift crescendo until it reached a volume that well nigh shattered the ear drums. It was the alarm. The Breggia were coming!

Immediately all was excitement. Dinner was forgotten. The four rushed to the balcony and watched the scene in the square below. Many Neloia were on the streets and now, panic-stricken, these rushed in all directions. Confusion prevailed for a time but very soon the streets were practically deserted. All but a few of the inhabitants had reached safety, and those remaining behind were guards and police whose duty it was to see that none remained in unprotected places. Fearful silence among the watchers; then a roar and a quivering of the building with the measured tread of a great army of advancing creatures who must have been of enormous weight. From the uppermost portions of the tall buildings shot forth the rays of myriad searchlights, illuminating the streets with the brilliance of daylight. The Breggia could not see in such light, but were guided by the building walls and came in such numbers that they could not go wrong. They simply filled the streets, covering every portion of exposed pavement so that nothing in their path could escape. When they came upon one of the Neloia who had failed

to get under cover in time, he was generally killed by breaking his neck and carried away when they retired. Sometimes though, he might be borne away in triumph, alive, for later subjection to unspeakable horrors of torture. Frank could hear their approach up one of the side streets, and as Ky-lea shivered with dread she was led inside by Jack, who desired that she be spared the sight so soon after her bereavement. Frank remained with Ky-lin and watched breathlessly.

A scream rang through the deserted streets from close at hand as some unfortunate laggard met his fate. Ky-lin paled and clenched his fists. Nothing could be done. The Breggia were so nearly immortal that the efforts of the Neloia had thus far produced no means of exterminating them or of even killing one of the brutes. All known energies had been tried. Sometimes they had been able to paralyze one of their enemies for a space but the victim always recovered and escaped before a capture could be made. Huge machines had been constructed at the rim of the plateau to decapitate the creatures as they came over the edge. But this did no good, since the bodies kept on with their progress and work of destruction, seemingly without missing the lost appendages. Gases had been used without effect. Penetrating missiles covered with every conceivable variety of poison had been tried. All to no avail. The scientists of the Neloia were at their wits' end.

With a bellow of rage, one of the creatures turned a corner and swung into the square. This was evidently the leader of the horde, and with a shudder of disgust, Frank cast his eyes on the first of the Breggia he had seen. The creature was fully forty feet in length and its body reminded Frank of some of the antediluvian monsters he had seen in reconstructed skeleton form in the museum back in New York. This was a huge scaly lizard with a horrible and ferocious human head. Ky-lin drew the now speechless Frank within and bolted the heavy shutters. They watched the scene in the square through one of the screens, such as was used in the space fier. The leader of the Breggia reared up on its hind legs, bracing itself in a vertical position with its massive stumpy tail and clawing the air in a frenzy with the long curved talons of its forefeet. The huge head, human, yet indescribably inhuman, swayed from side to side blindly in the light of a dozen searchlights. It was a horrid sight, terrifying in the extreme. Hundreds, thousands, of the Breggia swarmed into the square, packing it to the utmost. The monsters lumbered about in their blindness, stumbling against the palace walls, but ever feeling, clawing for some poor Neloie who might have been unable to escape. Some reared up as the leader had done and clawed at the palace walls. Frank was trembling with excitement, and Ky-lin almost wept in helpless rage.

From the globe in the center of the room came verbal reports from the outlooks stationed in towers at various points about the city. One by one these turned in their accounts of Neloia captured and killed. Three here, twelve there, thirty at the entrance to one of the mines. It was terrible to Frank. How much more so it must have been to Ky-lin. These were his people and he was powerless to help them.

Jack and Ky-lea had disappeared to one of the inner rooms but all through the night Ky-lin and Frank watched the screen and listened to the incoming reports. Things were not as bad as they had been during some of the raids, according to Ky-lin's advice, but they were bad enough. As nearly as could be made out from the reports of the look-outs, almost two hundred of the Neloia had fallen victims this time. Often the number was closer to a thousand. With the first hint of approaching dawn the Breggia left, lumbering away in their speedy awkwardness like the hippopotami of Visin. Again the ground shook and snarls of rage and disappointment filled the air.

Jack entered the room with Ky-lea on his arm. She was exhausted from her vigil, red-eyed from weeping. Jack had kept her from the viewing screens and the two had sat in the library throughout the terrible night. Frank's heart went out to the sorrow-laden people, and he swore to himself a great oath that some way, somehow, he would pave the way for their migration to his world, and that quickly.

All four were exhausted, and Ky-lin led his sister to her suite as Frank and Jack repaired to their own quarters. Frank was so worked up that he had no thought of sleep in spite of his weariness. He insisted on talking over the situation with his friend. He had not realized what a tremendous force this was with which the Neloia must contend, had not appreciated the dispiriting effect of such horrors as he had just witnessed. It had been a surprise to him that so wonderful a people as the Neloia could be such fatalists, so resigned to a condition which, as he thought, must surely be susceptible of some means of remedy. But now he understood and he wished to talk about it. Jack was terribly upset over the effect on Ky-lea this time, although he had seen many such raids in the past and was himself more or less hardened to them. Still he was willing to talk and to forego his own sleep, so the two men remained in Frank's sitting room for the entire morning, engaged in earnest conversation.

CHAPTER V

"DOC, old man," commenced Frank, as he nervously paced the floor before his friend, who sat with his head bowed in his hands, "This thing is awful; hideous. Do you mean to say that this sort of terror has been the lot of the Neloia for years?"

"Not years, Chan," replied Jack, looking up. "No, not years merely. Ages. You must remember that many generations gone, when our own world was still very young, the Neloia were a great people and numbered several billions. They were happy, peaceful, prosperous, and had already mastered science to a far greater degree than is yet understood on Visin. The cataclysm which reduced the population of Uldur by half and sent millions scurrying to the underground world, occurred more than ten thousand years ago. Evolution set to work, both on and under the surface. The brave souls who remained on the surface developed into an even more advanced and intelligent race. The under-surface dwellers developed through the ages into the monsters you saw last night. For several thousand

years there was no contact between the two, and meanwhile the Neloia had been still further reduced in numbers by the death agonies of Uldur, upheavals which have continued with increasing frequency and violence. Eventually, the Breggia, as now existing, ventured forth under cover of darkness and nearly wiped out, in a single night, one of the largest cities of the Neloia. They were fought against with desperation, but what could be done?"

"Apparently the Breggia cannot be destroyed. Through the ages has this one-sided warfare continued, until the number of remaining Neloia became pitifully small and all retreated to Ulderg, the capitol, and improved and enlarged the old city on the plateau as a last resort. They were safe for many telani, but eventually the Breggia learned of their whereabouts and resumed warfare. Fortunately the city is well protected by the nature of its habitations, and if all could be kept within at the time of these raids, none would perish. But the Breggia come without warning and so speedy is their approach, that always some fall miserable victims, notwithstanding the elaborate look-out and alarm system that has been developed. The morale of the Neloia has become absolutely undermined."

"But, Doc, has everything been tried in an effort to discover some way of destroying these revolting creatures? Have the Neloia tried disease germs, for instance?"

"Chan, that is ridiculous," he replied. "You have seen for yourself how far in advance of our own people the Neloia are in scientific matters. Of course they have tried everything. Bacteria of every known disease have been used without effect. Heat energy, explosives, all sorts of energies unknown to us, have been experimented with and no results of consequence obtained. And the worst of it all is that, even after we satisfy the Neloia that they will be welcome, it will take so long a time to carry them all to Visin—thirty thousand per trip of the fleet—thirty round trips, and all trips cannot be made as quickly as was yours. The two planets were almost in conjunction then. Meanwhile the Breggia grow stronger and bolder." He shook his head despairingly. Evidently, Jack's courage was flagging.

"Somehow, Doc, I can't help but feel there is some way of defeating the brutes," Frank blurted out, "and I'm damned if I don't find it myself, too. Laugh if you wish. I know I am just a narrowed, restricted planner of fool buildings for fool people, but I haven't lost my nerve anyway."

"No, I won't laugh at you, old man. But I tell you it is hopeless. Had you been here as long as I have you would readily agree. But go to it. Who knows but you may be right?"

"Maybe I was talking a little out of turn, Doc, and I haven't a plan of any sort. But just the same I still think that a way can be found—by some one."

"Chan, the greatest scientists of Uldur have been working on the problem for generations and are still hard at it. The time is too short for them to do much more. The migration must be accomplished before the race is extinct. Think of what good these people can do for our world. Why, with the combining of the

peoples of the two planets and with the environment of our earth to help the Neloia, Visin will become a veritable paradise."

"Indeed it will, Doc. I can hardly wait until the move is consummated. But I can't get the idea of the hideous Breggia out of my head. To think of leaving the Neloia to their mercies for a year or more is simply out of the question. But, as you say, and as the Neloia themselves resignedly repeat, 'What can be done?'"

"Now Chan, I know how you are broken up over the raid. I was the same way myself when I witnessed the first one. But you must just keep at the mastering of the Rulgen and get back to Visin to have one constructed as quickly as possible. Ever since I have been here I have been attempting to persuade the Neloia to take a chance and land at least one shipload on our earth—to make their own negotiations in person. They will not consent. They are too conscientious, too fearful."

"Oh, I am keeping on with the Rulgen, never fear. I am told that two more lessons will do the trick. Hope it works."

"It will work, Chan. I have no fear of that. I have seen too many of the same sort of things done. It is a marvelous method, don't you think?"

"Wonderful," agreed Frank, "Think of how the mental status of our own peoples could be improved by such methods. It will revolutionize our world, since by its means the Neloia can well be able to impart all of their knowledge when they come to us."

"Yes, Chan, that is exactly what they mean when they say they will repay. They could bring plenty of gold, too, but I think that would be a mistake. It might do more harm than good; it might even destabilize the money markets and cause another war on our fool planet."

"Gold!" snorted Frank contemptuously, "What does gold amount to when there is a glorious race to save. I hope they never bring an ounce of it to our world. What they have to offer is far more precious. But Doc, old friend, don't take my ravings too seriously. I'm sorry I've kept you up. And now it is time for me to leave for the laboratory."

"You didn't keep me up, Chan. I told you I was not going to bed anyway. And besides, I was expecting you to be raging after seeing the raid. I stormed for days myself the first time."

Jack ran his fingers through his already badly mussed blond thatch as Frank prepared to leave. He sighed when he thought of Ky-lea. He loved her to distraction and was mortally afraid for her safety. Now, with the coming of Frank though, he was in some unaccountable way encouraged. He had not spoken of this to Frank, but whenever memories came to him of the old days when his friend had led the Varsity eleven to victory time and again, stubbornly fighting against odds which would have discouraged anyone but Frank, he cheered up at once. Good old Chan, he thought, he seemed to be getting back to his old fighting form. As he watched his friend disrobe for the sprangly used shower, he marveled at the steely muscles that rippled under the film integument of his back; at the determined poise

of his well-shaped head; the strong set of his chin.

From the depths of the cold spray Frank shouted, "Well, Doc, this helps a lot. Cheer up, old man. You'll get back to Texas yet. And believe me, you'll show your home town folks a bride to be proud of, too. Wait 'til your folks see the beautiful Ky-lea. And wait 'til some of our old chums see the rest of the gorgeous Neloia girls. Boy, but there'll be some scramble. Theatrical and 'movie' magnates will be stricken with apoplexy." He laughed with his renewed good spirits.

"Attaboy, Chan," called his friend, "Now you're talking like yourself again. Lord, but I feel better now, too. Keep it up."

Frank finished his toilet, whistling, while Jack looked on in amusement. Soon he was ready and with a cheery 'so long,' and a playful punch to the ribs, he was gone.

"Well, what do you know about that?" Jack thought aloud. "A half hour ago he was as low as I have ever seen anyone. And he has been drifting into crabbed old age for years, too, with his confounded hard work. I have a hunch something is going to happen."

He started for his own rooms, much heartened.

Frank went through his usual course of instruction with eagerness, and when he returned to full consciousness, he questioned his instructors regarding the underground life of the Neloia. He expressed a desire to see some of the cultivation of edible fungi and vegetation which was carried on beneath the city. Rete, the chief instructor, offered to take him below for a trip of inspection. Frank was much pleased at the prospect, since he had not seen any of the underground activities at all, so far.

CHAPTER VI

RETE led him to a small lift and in this way they descended rapidly for what seemed like a long period of time.

"How deep are those workings?" Frank inquired.

"The portion we are going to visit is some four thousand feet down, as you measure distance," was the response, "and I believe you will find this spot of extreme interest."

The car stopped suddenly and they emerged into a huge cavern, lighted by the same soft glow used everywhere by the Neloia. This light was reflected in countless colors of vivid brilliancy from masses of stalactite formations high overhead. The air was damp, but pleasantly odorous of life and of growing things. Hundreds of Neloia were busy among numberless beds of vegetation strange to Frank's eyes. Here was a veritable forest of mushroom-like growths, fully eight feet in height and with gleaming purple stems the size of tree trunks. The umbrella-like tops were from seven to ten feet in diameter and the undersides of these were radially pleated and of a roseate hue. Other growths lay close to the rich black soil and consisted of elliptical melon-like bodies attached to creeping, leafless vines. Frank was astounded, as he watched one worker bury a smooth, round article the size of a baseball and cover it with soil, to see the immediate sprouting and bursting forth of several bright orange plumules. The plant

grew rapidly as he watched, until it reached the height of about three feet, when the bright orange color faded to a sickly brown and budding fruit commenced to appear. The rate of growth seemed to slacken then and Frank turned to his guide with an exclamation of wonder.

"That is intensive cultivation, made necessary by the plight of our people," Rete explained. "Not all of our food-producing plants grow so fast, but there are several similar to this variety which produce edible fruit in from one to three days. Now, just follow me to the adjoining cavern and I shall show you some further developments of our experts in the line of food production."

Frank followed his guide to a circular opening in the wall of the cavern. This proved to be the entrance of a long passage through the rock, softly lighted by the usual glow from its arched ceiling. Frank was overcome with wonder as he examined the sides of this passage. Veins of pure gold, a foot thick, appeared at frequent intervals, sandwiched between strata of volcanic rock and quartzes.

He had lagged behind his guide and when he realized this he hurried to catch up. As he started at a run, he was knocked from his feet by a violent concussion. The ground heaved and twisted under his feet. A deafening crunching and grinding told of the shifting of thousands of tons of rock, and Frank found himself lying face down in total darkness. He dragged himself to his feet, bruised and sore, and felt his way along the passage in the direction Rete had led him. Not more than twenty paces ahead he came against a barrier of rock which had been forced into the passage. That way was blocked. He retraced his steps with the intention of returning to the cavern they had just left. Several times he fell, striking some portion of his anatomy against jagged rocks each time. In less than fifty feet he found the passage blocked in that direction also. Frank was entombed!

He sat down in the darkness and with considerable effort set about to compose his mind and recover his courage. Possibly he would be compelled to wait for hours, even days, to be dug out by the Neloia. The prospect was not encouraging but he resolved that he would not lose his head. He was sure that this had not been a far reaching tremor. It was not violent enough nor of long enough duration for that. Quite probably the only serious damage had been done in that very portion of the passage occupied by Frank at the time.

When he was somewhat recovered, he commenced a methodical inspection of the walls of his prison with a view of locating some other means of escape. The darkness was complete and he felt along every inch of the walls on both sides of the narrow space. He spent what seemed like hours in this manner and was just about to give up in despair when he felt a breath of fresh air wafted in from overhead. He stopped at this point and, stretching on tip-toes, he explored the walls on both sides as high as he could reach with his finger-tips. Finally his fingers slipped into an opening and encountered emptiness. This was the lower edge of a

fissure and as he felt along the ledge he found that it extended some four or five feet in the horizontal plane. How high this opening went he had no means of knowing, but he decided to make the attempt to get up there and investigate.

That was a task in itself, as he soon learned. He jumped time and again and obtained a firm finger hold but could not pull himself up on account of the slipperiness of the rock. It seemed to be of soapstone, and whenever he hung his weight from the now weakening fingers, they slipped and he fell to the floor of the passage. After several such attempts, he gave up and started feeling for some loose stones to heap under the opening. With much painful labor, he gathered about a dozen rectangular and flat blocks of all sizes, some of which were so heavy that it was all he could do to move them. From these he built a pile of rock some two feet high and, climbing this, he found that he was able to get a firm purchase and draw himself up into the opening. When he had clambered over the ledge, he was so exhausted, that he lay absolutely still for a moment, breathing heavily.

UPON investigating further, he found that the fissure was just about high enough for him to crawl through on all fours, which he proceeded to do, feeling his way cautiously. This passage must have been opened up by the tremor or earthquake, which had closed the other. It led slightly downward and the degree of slope increased as he progressed. After an interminable period of the careful feeling and creeping progress, the passage becoming so low in places that he was forced to wiggle through on the flat of his stomach, he was electrified by the sound of voices ahead. He stopped and listened. He could not make out the words at the distance, but he felt sure that these were none of the Neloia. The qualities of the voices were entirely different, harsh and rasping, where the Neloia spoke softly and caressingly. With a start, he realized that he must be close to the realm of the Breggia and he now moved very cautiously, remembering that they could see distinctly in the darkness. His heart thumped so violently, that he feared it would be heard and his presence betrayed thereby. When he drew closer, he found that he could make out the trend of the conversation. The speech was a corruption of the language of the Neloia but still understandable for the most part. When he was close enough to hear plainly, he lay quietly, listening.

Two voices were all that he heard, and when he caught the drift of the conversation, he thrilled with excitement. Evidently one voice was that of a mother Breggia and she was wailing her grief and berating a dying son for his carelessness. The son gasped excuses and apologies and was obviously suffering intensely. The voices came from below, and, feeling ahead, Frank found that his passage ended at a ledge of some other large cavern and that the two Breggia were directly beneath this ledge. He could see nothing but could hear perfectly and as long as he kept back from the edge it would be impossible for them to see him either.

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So the Breggia were not immortal. He chuckled to himself at the thought and strained his ears in the effort to learn what it was that had brought about the intense suffering of the young Breggia and his approaching demise.

"Heedless son," spoke the mother, "how many times have I warned you of the Edlis, the only living thing feared by the Breggia. Why did you not heed my warnings? Now shall you die in torture and your poor mother will be disgraced."

"But mother," gasped the dying offspring, "no purple flowers were on this plant. I did not know."

"You should have known. Have I not told you of the prickly-edged leaves in groups of five, of the furry stem which none can mistake? Did I not warn you that a single drop of the sap of the Edlis, if crushed on the skin of one of us, is sufficient to cause death by the rapid absorbing of the poison into the blood stream and the carrying of it to the heart?"

Frank had heard enough. The young Breggie was now seized with horrible convulsions and screamed his last. The mother wailed and moaned in grief, not so much over the loss of the son as over what she considered as her own disgrace in thus losing him.

Now if he could only make his way back to the Neloia, Frank felt sure that he had the secret of conquering the dread enemy. He was in high fettle as he carefully retraced his way along the low, slippery passage. The way was upgrade now and he experienced considerable difficulty on the return trip. It seemed very much longer going back, and his feeling of triumph gave way to one of dejection as he lost strength and remembered that he was trapped underground and might never again see the light of day, much less carry the important news to the Neloia.

Eventually he reached the end of the passage and felt over the edge preparatory to the drop into the passageway which had caved in. His only hope lay in the news of his plight having reached his friends, and in their quick action in getting to him. He listened for the sound of drills and picks working at the rock which closed him off, but heard nothing. He decided to await his fate, whatever it might be, in the original passageway. As he let himself over the edge, he lost his hold and fell heavily to the ground, his head striking a rock with an impact that mercifully rendered him unconscious.

MEANWHILE turmoil reigned in the palace.

Rete had escaped injury in the underground tragedy and hurried to the surface with the news. He had found the passage blocked, and upon communicating with the works in the first cavern, he learned that it was closed off at the other end also. He reported this directly to Ky-lin and the sensation it created was instant and electrifying. Ky-lin called for Jack and the Urdia at once and all were greatly perturbed at the news. Strict orders were given that the story of the disaster be kept from the public, and a force of one hundred workers with tools and provisions was sent below at once.

Jack begged for the personal privilege of leading

the rescue party and his request was granted without argument.

Two and a half days of gruelling toil followed, the workers laboring with pick and shovel and rock drills in shifts of three arg each, the equivalent of about two hours. All but Jack. He slept not a wink, nor did he rest. His only respites were during the occasional periods when one of the workers would urgently request him to take a portion of food. Even then he bolted it. How his body stood up under the strain, none of the Neloia understood. But they did understand love and sincere friendship and they realized that this indefatigable leader was kept up by his feelings for his friend.

They had removed fully thirty feet of solid rock from the blocked passage and it seemed that they would never break through. Jack's great fear was that his friend had been actually buried by the falling rock and crushed, but he worked on with the hope that this was not the case and that they would find Frank alive.

Just when hope was about to be abandoned, one of the workers uttered a yell of delight. His pick had sunk through the barrier to its handle. With a hoarse cry Jack thrust the workman aside and tore frenziedly at the rock with his bare hands. Carefully they enlarged the opening until it was of sufficient size to permit Jack to crawl through. The rest waited anxiously, but not for long. Soon Jack returned to the opening and lifted the inert form of his friend to the eager hands of those outside. As they bore the apparently lifeless form of Frank through to the main cavern, Jack collapsed and had also to be carried.

Attending physicians pronounced Frank alive, though very near the point of death. There was great rejoicing as the two men were transported to the palace.

Frank awoke in his own bed in the suite he had occupied since his arrival on Uldur. Wonderingly, he looked from Jack, who stood at the foot of the bed with Ky-lea at his side, to Ky-lin, who was watching with grave concern. Rete sat at one side of his bed and one of the court physicians stood at the other with his finger on the patient's pulse. At the physician's words, "He will recover immediately," the expressions of the faces about him changed magically from that of deep depression to great joy.

Frank smiled wanly. He didn't feel so terribly ill. He attempted to sit upright but fell back with a groan. Every bone in his body ached. His muscles would not respond. But his head cleared instantly and he almost shouted with glee as he recalled the disclosures of the unwitting Breggia in the strange underground retreat.

"Jack! Ky-lin! everybody! I have the secret of the one vulnerability of the Breggia," he cried. "Doctor, administer a stimulant or something to give me strength to tell the story so that work can be started at once."

The physician shook his head but Frank insisted, "I am all right I tell you. It is only physical exhaustion now. I'm not raving. I tell you I visited the Breggia in their realm and learned of their one weakness. Please, please do as I say."

They realized that he was in earnest and in his right

mind. The physician bared the left arm and gave Frank a hypodermic injection of some sort. Immediately he felt the blood coursing warmly through his veins; a new strength suffused his being. He sat up and with eyes bright with excitement, told his story to the spellbound listeners. At his conclusion, Ky-lin exclaimed in wonder:

"The Edlis," he repeated in astonishment. "Why that is one of our commonest underground growths. To us it is neither food nor poison. It is a weed; worthless; a pest that is torn up from our gardens and burned in the incinerators. Time and again have our biologists analyzed its sap and fibres in the effort to find some use for it. Strange that we have never suspected it might be poisonous to the Breggia. Frank, you have saved the day. You have relieved my people from their greatest immediate danger. We shall proceed at once to prepare for the next raid of the enemy."

He kissed Frank on both cheeks in his excitement and gratitude. The effect of the stimulant had now worn off and Frank sank down in sudden reaction. He slept. After listening to his heart, the physician pronounced him past danger, and all of the visitors left the room silently but with thankfulness in their hearts.

CHAPTER VII

KY-LIN called together the Urdia and the most eminent scientists of the Neloia were summoned to the Urdesil. Jack was jubilant. Here was a friend to be proud of. The confidence of the Neloia would be supreme. Undoubtedly their own flagging courage would be bolstered up and the smouldering spark of bravery in defensive warfare be rekindled. Jack loved a fight himself and he felt assured that a real one was coming. The tables would now be turned and the one-sidedness be shifted to the opposite direction. The Breggia would receive their just deserts.

The scientists received the news with great surprise. At first they could not believe that the harmless Edlis was so greatly to be feared by the Breggia, but so convincing was the story told by Frank and repeated by their monarch that they could not help believing in the end. Ky-lin issued his orders with speed and with the sureness of a born ruler of men. Within the arg all plans had been made and the various department heads were on their way to set the machinery of preparation in motion.

All available workers were sent below to search the uncultivated underground passages and caverns for the now precious Edlis. Every chemical laboratory that could be spared from regular food production was turned over to the process of extracting the sap from the fibres of the suddenly important growth. Dozens of manufacturing establishments were re-tooled and equipped to produce large numbers of compressed air rifles for the hurling of breakable capsules of deadly liquid against the thick scaly hides of the Breggia. Thousands of men began their instruction in the use of the new weapons.

By the time Frank had completely recovered from the effects of his experience, considerable progress had been made. The passage which he had followed to the

lair of the Breggia had been closed off by solid masonry to prevent the possibility of an attack from that quarter. Untold numbers of the Edlis plants had been gathered and sent to the surface in large hampers. The chemical laboratories had extracted and stored in huge vats great quantities of the sap. Over ten thousand of the special rifles had been constructed and nearly five thousand men were at work filling and sealing the capsules to be fired from these weapons. An outer alarm system had been constructed to warn the defenders of the approach of the enemy at an earlier time than had been provided previously. Ramparts were being constructed around the edge of the plateau, behind which the defenders might make the first stand and give the attackers their initial taste of the doom which was being prepared for them. Wherever Frank appeared he was hailed as a great hero, the saviour of the Neloia. This embarrassed him greatly and, after the first few experiences, he kept to the palace and the laboratories as much as possible.

His last lesson on the construction of the Ruglen had been completed and the final result was even as the instructors had predicted. When he concentrated on the instrument, every detail of its intricate mechanism came to his memory with the utmost clarity. Having been a first-class draftsman in his own line, he found that he could sit at the drawing board and design accurately any separate part, complete with dimensions and material specifications. Or he could lay out the completed assembly and dictate minute instructions as to its operation. In short, he had become a technical wizard—on the one piece of apparatus.

With the prospect of a pitched battle with the Breggia which could have but one ending, that of their complete defeat, the need for haste in getting the negotiations with Visin started was not so great. It was decided that Frank should remain until the battle was over, and he entered into the preparations himself with zest. Day by day the supply of weapons and the numbers of trained warriors increased. The enthusiasm of the Neloia grew with their confidence.

The entire atmosphere of Ulderg was changed. Smiling countenances were the rule rather than the exception. Even the occasional tremblers which shook the city and warned of impending disaster had little depressing effect. The old planet would probably hold together long enough to permit of the migration to Visin. The dread of the Breggia was gone. Their own revered ancestors and their loved ones must be avenged. It was a wonderful rejuvenation of a wonderful people.

Frank was given command of a division of the new army, as was Jack. Ky-lin himself was commander-in-chief and planned to organize the defense and lead his forces personally in the impending conflict. Great numbers of powerful searchlights had been installed along the ramparts. Twenty thousand trained and fully-armed men were in readiness. They must not, could not fail.

Patiently the Neloia waited but the Breggia did not appear. Frank grew nervous, morose. He craved action and told Jack so in the privacy of their quarters. His friend laughed at his bloodthirstiness but secretly

admired his vigor and restless energy. This was the Chan of the old days, the same old Frank who had been carried so many times from the gridiron on the shoulders of a howling, hysterical mob. Jack was delighted, knowing that his friend would be a different and happier man when he returned to his own home. Not once for weeks had Frank thought of his old office. He had not even inspected it through the Rulgen, though he spent a great deal of his time exploring planets other than Visin with its aid. Jack felt sure that the cure was complete and permanent, and was proud of his achievement in bringing Frank to Uldur. He had no regrets. Apparently his friend had none either.

Ky-lea spent much of her time in the company of the two men and Frank became more impressed with her beauty as the days passed. Not only beauty of face and body but of character as well. The glorious creature simply adored his friend. She watched his every move with the light of love shining from her incomparable eyes. Her every spoken thought betokened love and a sweetness of character that was beautiful to see. And Jack reciprocated this affection with everything in his make-up. He did not attempt to hide his feelings from his friend. Suddenly Frank became acutely aware of his own need for a companionship of this sort and he resolved that he would find his own mate among the Neloia. But that could wait.

Frank grew deeply interested in the study of astronomy under the efficient tutelage of Rete, who had held him in great respect since the day of the cave-in. With the aid of the Rulgen, he was initiated into the mysteries of life and civilization on many of the heavenly bodies he had hitherto thought of only as stars. He now saw why the Neloia had chosen Visin as a refuge rather than some of the others. His own world was not so bad a place after all.

On the fortieth night after his arrival he sat with Rete, observing the progress of a terrific battle of giants on the planet Mercury, known on Uldur as Kevis. As they became greatly wrought up over the distant events, they were startled by the weird wailing of the alarm. The time was at hand!

BOTH ran for the lift and were quickly carried to the underground passage that led to Frank's sector of the line of defense. Hundreds of his Neloia crowded the swiftly moving platform headed toward the ramparts, and a great cheer arose for Frank as he joined them. In a trice he had disembarked and, shooting to the surface in another lift, he took his place at the head of his division, which was rapidly forming in perfect order.

The great searchlights covered the valley in every direction, but all was peaceful as yet. The depth to the valley was about three hundred feet and the face of the cliff was smooth and sheer. Frank had often wondered how the Breggia were able to scale those heights and he still could not understand it. No one who had seen them do this had survived to tell the tale, and it was as much a mystery to the Neloia as it was to him.

Not yet were the Breggia in sight, but soon the

rumble of their approach could be heard in the distance. It was like a stampede of crazed cattle on the western plains of his own country. He shouted a few words of encouragement to his men and warned them not to discharge their weapons until his command was given. This was to be a complete surprise to the enemy and was not to be sprung until there was absolute certainty of the effectiveness of the fire. The rumble increased in intensity and shortly a rippling, rapidly advancing mass of the attackers could be seen entering the field of light produced by the searchlights. On they came with the speed of an express train. The front line spread wide as the fearsome creatures prepared to surround the city and attack from all sides. There must have been fifty thousand of them. This was a super-raid, many times the usual number were coming. Blindly now as they came into the brighter circle of light, they advanced without slackening speed. The unwonted brilliance must have been a surprise in itself, but evidently the very light that blinded them guided their advance.

When the front line was within a thousand yards of the cliff, the little globe in Frank's hand spoke forth Ky-lin's order to fire. Instantly he repeated the command to his men, who, with great fortitude had withheld their fire and remained steadfast. At his word, which was carried down the line by his lieutenants, five thousand of the new weapons spat forth their missiles of death to the Breggia. Fifteen thousand more of the weapons all around the rim of the plateau were likewise discharged for the first time against an actual foe, the only foe against whom they were effective. Through his glasses, Frank watched a effect on the advancing horde. It was not instant-neous, but suddenly there was a break in the front line. Many of the Breggia were down, clawing the air with their talons and filling it with raucous screams and curses. "The Edlis! The Edlis!" they screamed, but the warning seemed to be unheeded or unheard by those in the rear. On they came, trampling their dying, squealing fellows under their ponderous feet. Again came the command to fire and another break in the rush resulted.

Still the hordes behind pressed on and the struggles and bellows of the trampled, dying, stricken Breggia increased to a bedlam, the clamor echoing and re-echoing from the surrounding hills. Again and again the rifles of the defenders sent forth the little capsules of destruction. Fully half of the number attacking Frank's sector were down. But they were courageous, these dreadful monsters. The writhing mass was within a hundred yards of the cliff now, when with a tremendous rush, a flying wedge of the creatures reached its base, directly beneath.

A company of Frank's Neloia clamored over the rampart and, lying face down at the edge of the precipice, fired round after round into the yelling, milling group below. The stricken Breggia, piled high in their scrambling death agonies, clawed at the walls in efforts to reach their tormentors. Reinforcements rushed forward with incredible rapidity, climbing over the dead and dying in frantic rushes toward the top. The pile had become so great that with a tremendous running

leap, one of the largest of them reached the edge and clawed wildly for a section of the rampart, which broke away in its powerful grasp. It had gained a footing and Frank rushed to the aid of his Neloia at that point. This one had enormous resistance, since it had been literally spattered with the deadly juice of the Edlis in the bursting capsules fired from every angle. Frank discharged his own weapon full in the slaving mouth of the creature and with a screech and a frightful curse, it lost its footing, floundered on the rim of the plateau, clawed for a new hold. Then, whimpering, and with several of the terrified Neloia clasped to its slimy breast, it tumbled over the edge to join the mass of its fellows below.

Calmly, methodically, the long line of defenders back of the ramparts continued to pour forth their deadly fusillades. The enemy was decisively overcome, but relentlessly the Neloia continued shooting down the survivors. This was a just and long overdue vengeance. The pent-up fear and hatred of the ages now vented itself in the lust for complete extermination of the enemy. Very few escaped, and as these sped into the outer darkness, not once did they look back on the scene of the battle. The Breggia would not soon return for another dose of the destruction which had been meted out.

After an interminable period of watchful waiting, the command to disperse came from Ky-lin and was passed along the line. Cheers and laughter filled the air as the relieved warriors started for the city, the city which they had so bravely defended.

FRANK made his way to the palace as quickly as possible, and there in the Urdesil he found an immense and joyous gathering. Ky-lin and Jack arrived at about the same time and the three mounted the dais at the end of the room. Ky-lin stood before the throne with the two visitors and three of the Urdia flanking him. He stilled the crowd with a wave of his hand and they listened breathlessly to his short speech.

"Dear people," he said, "we have finally routed the ages-old foe. Less than twenty of our number were killed in the battle, while fully forty thousand of the Breggia now lie in the valley, polluting it with their detestable bodies. I am certain that we have no more to fear from the remaining millions. When the knowledge that we have discovered the secret of the Edlis is spread among them by the survivors, no more will they risk attacking us. Though stubbornly brave in battle, they are in reality skulking cowards and quite evidently fear the Edlis to the extreme.

"Our victory is entirely the result of the bravery and quick thinking of our dear Frank, the second visitor brought to you from distant Visin. In your name I thank him, as well as in the name of Ky-mar, my lamented father. Would that he could have remained with us to witness the victory of our people.

"You may now return to your homes in peace and with the assurance that the dread of ages has been removed. Soon will our dear Frank return to his own home to complete negotiations for our migration to Visin. Our scientists tell me that Uldur is in no im-

mediate danger of destruction by the forces of nature and that there is left to us plenty of time in which to accomplish our move without undue haste. Ere I appear before the crowd in the square to thank our warriors, I feel impelled to announce the betrothal of my dear sister Ky-lea to Jack, who has been with us for so long a time and is so dearly beloved by all. This will be a union that should bring great happiness to all of you as it will to me. And it will be another bond between the peoples of the two worlds."

At his conclusion, the blushing Ky-lea joined her lover and bowed to the applauding audience, while the embarrassed warrior at her side grinned sheepishly. Cries arose for a speech from Frank, but he had already made his way to the balcony to observe the gathering in the square and to get away from the plaudits of those within. Here he was joined by Ky-lin, and the din in the square became tremendous when the multitude saw the two for the first time since the battle. A holiday spirit prevailed. All were celebrating hilariously and cheered the occupants of the balcony with the combined power of their thousands of robust lungs. Never had the ancient square of Ulderg seen such a joyous demonstration before.

After a few minutes of this, Ky-lin and Frank withdrew. With a hearty grip they separated and made for their own apartments. Frank found his friend waiting for him and they had a little celebration all their own in Frank's sitting room.

Far into the night they talked, discussing the battle and making plans for the future. With great glee they recounted incidents of the fight as seen in their own sectors. Jack had solved the mystery of the scaling of the cliffs and it was really no mystery at all. At one point below his troops there had been a section of the front line of attackers which was not fully covered by the fire of the defenders, due to a company of his men not having been sufficiently supplied with ammunition. At this place the Breggia had gathered in dense formation, advancing rapidly to the base of the cliff in a solid phalanx. They had simply built a pyramid of living bodies braced against the cliff, and those bringing up the rear had scrambled up the pile, reaching the top just in time to be met by a company of reinforcements that Jack had hurried out. They had been repulsed with the loss of but seven Neloia, and only three of the Breggia had been able to obtain a foothold at the top. The slaughter had been complete here, the mass at the base of the cliff being entirely annihilated by the withering fire of the defenders. Oh! but it had been a great fight!

CHAPTER VIII

FOLLOWING a few days of rest, the plans for Frank's return were resumed. He was now anxious to leave, to get things started on his own world, to arrange for the coming of the Neloia at once. What a story he had to tell to the nations of Visin! And they could not doubt, once the Ruglen was completed and in operation. He felt like an emissary of the gods, and yearned for quick results. Frank was, even as his friend Jack had observed, his old self once more. Never would he become the slave of his work

on earth, never again desert the fellowship, companionship and love of mankind.

With Ky-lin bound by his new duties as Randaten, it was not possible for him to leave his people. Thus was it arranged that Rete would command the vessel that carried Frank to his own home. Hundreds of the Neloia petitioned the Randaten for permission to accompany Frank on his journey as far as the flier traveled. Ky-lin issued passes to about one hundred of these Neloia who had been most closely associated with Frank during his stay and who had come to love him as one of their own. Jack, of course, was one of the party and when the day of the start arrived, he bid the beautiful Ky-lea a fond farewell in the throne room of the palace as Frank and Jack looked on with misty eyes.

All was in readiness and the group of accompanying Neloia was aboard one of the space fliers when Jack and Frank were escorted to the landing platform by Ky-lin and several of the Urdia. After receiving a few words of parting advice from out the wisdom of the magnificent Ky-lin, and hearty hand clasps and good speeds from the Urdia, Frank regretfully entered the flier, with Jack bringing up the rear and bolting the entrance door behind them.

They proceeded to the control room at once. Here they found Rete at the controls, eagerly awaiting their arrival. The two Visinia sat beside him at the viewing screen as the ship swiftly arose from its cradle and hovered momentarily over the square, where a large gathering had again formed, this time to witness their departure. At high speed the ship traveled over the surface of Uldur to reach that portion facing toward Visin at the time. Observations had been made in the laboratories of Ulderg and the course and timing of the trip had been plotted in advance for the guidance of the navigator.

On the screen, Frank had his last sight of the desolate surface of Uldur and this time he was able to see a great deal more than he had on his arrival, since the flier passed nearly a third of the way around the globe before leaving its atmosphere. The yawning black pit which marked the entrance to the realm of the Breggia was pointed out to him by Rete, and he shuddered as he visioned the intolerably ugly forms of the creatures.

As the ship headed upward and the speed gradually increased until the atmosphere of the planet was left far behind, Frank left the control room, arm in arm with his friend, and in his heart was a mixture of sadness at leaving the Neloia and of joy at thought of what he had set out to accomplish in their behalf.

The return trip was uneventful as far as outside happenings were concerned. But within the flier all was gaiety and a continuous round of celebration during all waking hours of the four and a half days. The Neloia feted and entertained Frank in every manner that could be conjured from the recesses of their fertile brains. Never had one of these space fliers, which had been constructed in desperation and in sorrow, witnessed such scenes. The Neloia were a completely rehabilitated people—the sickness of their minds had vanished, leaving them fearless and joyous, looking into the fu-

ture with faith and hope that all would soon be well.

Eventually the vessel came to rest within some ten miles of Visin and preparations were made for transporting Frank to his own environment by means of the energy which had been utilized in bringing him to Ky-lin's flier. His many friends on board showered him with praise and good wishes—not bidding him good-bye but using the Neloic word which is the equivalent of *au revoir*. After administering the hypodermic injections to refit his body for life on Visin, Jack and Rete accompanied him to the operating room of the energy and, as he lay on the table beneath the great golden sphere which produced the force, Jack pressed into his hands a bulky case, which he told him contained photographic and written evidence of the life on Uldur. This he was instructed to grip tightly and to use in his preliminary representations to his government when applying for a staff of experts to construct the Rulgen. Jack bid him a fond and cheering farewell, as did Rete, who turned at once to the control board, which was set into the wall of this cubicle. Several adjustments were made, whereupon Rete called a warning for him to grip the packet tightly and another word of parting cheer; then he pulled the main switch.

A brilliant green flash, accompanied by the sensation of a terrific explosion, blinded and temporarily stunned Frank. He closed his eyes to the glare and dimly, despairingly, realized that he had dropped the precious case of papers.

* * * * *

THROUGH his closed lids came the impression of a new and brilliant light striking from the side. He had not moved! Something had gone wrong with the energy. He opened his eyes to the new light. It was the sun. He sat up with a start and his head struck a hard object—the bench in Battery Park!

It was early morning and the sun, coming up in the east, gleamed and shimmered with familiar brightness. Much more brilliant it was than the morning sun on Uldur. But Frank's heart sank as he came to the conclusion that he had slept and dreamed in the park like a common vagrant. His adventures had been but a vivid dream. He must have rolled under the bench when he fell asleep, thus remaining hidden from the eye of the law and the sight of chance passersby.

But, no! He had not dreamed. There lay the pocket of valuable evidence at his feet. He had dropped it at landing, not before leaving. Joyfully he picked it up, hastily opened it. There reposed safely within a multitude of photographs of Ulderg, of the barren wastes of Uldur, of the Neloia, of Jack and of himself amongst the eerie surroundings of the distant world. Several bulky manuscripts there were, some in the language of the Neloia, some in Jack's own painstaking English chirography. With a quick recovery of his good spirits, he started for the street, hailed a passing taxicab and gave the order to drive to his rooms uptown.

CHAPTER IX

NEARLY two years later a little group of distinguished personages stood expectantly around the polished black surface of the Rulgen, which

had been built in accordance with specifications drawn up by Frank Chandler. The most expert optical instrument builders of the United States and Europe had labored incessantly to produce and assemble the many delicate parts. Materials from the four corners of the earth entered into its construction.

It was through representations made to Congress by Frank's uncle, Frederick Chandler, then Secretary of the Interior, that a bill was passed authorizing the erection of the small observatory in which the group was now gathered. A large appropriation had covered its cost as well as that of the marvelous instrument it housed. Through the Secretary's influence several foreign governments had been interested in the project and in the proposed negotiations with far-off Uldur.

All of these preparations were made in the greatest secrecy. It was felt that the time was not ripe for acquainting the world with the momentous undertaking until actual evidence was obtained through the medium of the Rulgen.

Now, with everything in readiness, microphones were set up in the room and operators from the Terrestrial Broadcasting Syndicate were at their posts, nervously awaiting the word when their announcements could speed forth to the unsuspecting millions through the three thousand radio stations comprising the chain that linked together the entire civilized world.

Frank left the telephone and approached the group at the Rulgen with ill-concealed excitement. He had been in conversation with several astronomical observatories and each had reported strange manifestations observable on the surface of the planet Mars, which was then at the point of its orbit closest to the earth. What these indications betokened they did not know, but it was evident that some unusual activity was in progress.

Among the group were high officials of the United States government, including the Secretary of the Interior, diplomats representing the principal foreign powers, several eminent scientists, and other important people.

Frank bowed and addressed them:

"Ladies and gentlemen," he said. "The moment is at hand when we shall see definite visual proof of the story with which most of you here are familiar. I have been in communication with three of the large observatories and they report something out of the ordinary on the planet Uldur, which we call Mars. With the aid of the Rulgen we shall soon see that which they cannot see through their inadequate reflectors. It will be our privilege to know for a certainty what their unusual observations indicate. I hope that in some way they are manifestations of preparations now being made by the Neloia. As you are aware, they have been able to watch our work through their own Rulgen, and so have known for some time that we are approaching completion of our task. But with your permission I shall proceed at once."

He stationed himself at the controls and, at his signal, the lights were extinguished. The group gathered closely around the black screen, which was dimly visible in the darkness. There was a whirring of the mechanism and in the center of the screen appeared a small red

orb which grew rapidly in size as the spectators watched in breathless silence.

"The machine operates to perfection," exulted Frank. "The small red orb is Uldur, the home of the Neloia. Please observe carefully now."

The action became speedier with his manipulation of the controls and the watchers gasped as the view of the planet rushed toward them and grew in size and distinctness. When the image reached nearly the full diameter of the screen, the focussing mechanism was stopped and exclamations of wonder came from the observers. The canals and other markings of the planet were clearly outlined and Frank saw that a dark-colored spot obscured a portion of the surface, alternately increasing and decreasing in size. This was evidently the unusual condition observed by the astronomers.

The whirring resumed and the approach became swifter. Frank, with a homesick pang, was reminded of his first experience with the Rulgen aboard the space flier. The same sensations again assailed him and a hasty glance at the tense faces, eerily lighted by reflection from the disc, showed him that his audience was deeply impressed.

One of them, Professor Borden, F.R.A., the famous physicist, remarked tremblingly, as if to himself, "The wonders of the universe are about to be revealed. How I have longed for such an opportunity!"

All were greatly excited and impatient to see more. Frank moved the focussing control to its maximum position and the image literally sprang at them. Only a small portion of Uldur's surface was now visible. Canals, valleys, ruined cities, became visible at close range. Objects familiar to Frank, but strange in the extreme to the other observers were distinctly seen. When it seemed that they were but a few thousand feet above the surface, the focus was again fixed and the exploring controls carried them rapidly along the route of one of the twisted, broken, unused, ancient highways. Frank was searching for the location of the unusual disturbance and his knowledge of the maps he had brought back with him told him the way. He knew that the region affected was in the neighborhood of the entrance to the realm of the Breggia, and he was proceeding to that place for a close view.

Remembered objects flashed by on the screen and Frank thrilled to the memories. Exclamations of surprise came from the spectators at the evidences of former civilization, at the barren appearance of the countryside, at the huge canyons and crevices from which poured the vari-colored vapors. Frank worried more and more as it became evident that conditions had grown steadily worse since his departure.

As he carefully manipulated the controls, searching for the unknown new condition, his mind went back to the words of Ky-lin, when he bid him farewell, just before his return to Visin.

These last words of the magnificent Randanat now stood out in his mind as if printed there. "Frank," he had said, gravely, "you are of the Visinia, a brave and noble man. But you have become one of us and we love and trust you. I know you will succeed with your own people and I now appoint you Ambassador Ex-

traordinary to them from my poor Neloia. Farewell, dear Frank."

"Ambassador Extraordinary!" he thought. "God grant I do not fail in my mission."

The area covered in the screen showed increasing disturbances. They were now very close to the lair of the loathsome beasts that had been the terror of the Neloia. Great convulsions in the interior of the planet had torn and scarred the surface very recently. Clouds of steam and of wind-blown ashes obscured the view here and there. Here appeared a river of lava—something Frank had not seen during his visit. A spasm of fear clutched him.

Soon the location of the great cavern mouth that had marked the Breggia's retreat was reached. It was now the crater of a great volcano in full eruption. Frank's fears were somewhat relieved. At least the Breggia were no more. And Ulderg was a considerable distance from the scene of the disaster. But the opening into the interior must be of great depth to have reached its internal heat. Surely a tremendous quake had been required to open it up!

The watchers, excepting for occasional involuntary clicks and whistles of astonishment, were strangely silent, spellbound.

Reversing the adjustment of the exploring controls, Frank hastened for a view of Ulderg. The greatest speed of redirecting was used and, within a short time, the view became that of the valley surrounding the city. Some signs of the blue-green vegetation had still survived when Frank last saw it. Now it was almost entirely barren.

"We are not any too soon," he muttered when he observed this.

Now the city of Ulderg showed in the screen and Frank centered this, stopping the motion. Suddenly the watchers became voluble. Here was proof indeed; The public square, the ordered streets, the glistening domes of the habitations, even the people moving hither and thither about their tasks like tiny ants, were clearly seen. Frank's spirits mounted. All was well in Ulderg.

With the focus readjusted the scene changed to that of the public square before the palace at close range. Some sort of gathering was in progress. Many of the Neloia crowded there with faces upturned to the balcony from which they were being addressed by Ky-lin. Frank's heart leaped as he made out the beloved features of the Randenan, and the interest of the spectators grew acute when they saw for the first time the wonderful people they had banded together to aid.

There was some excitement among the assemblage in the square and, as Frank focussed still closer to obtain a better view of Ky-lin and of the many upturned faces, he judged that the people were being advised by their leader of the fact that the Rulgen had been finished on Visin and that negotiations were about to start.

One of the diplomats present, a woman, leaned close to obtain a good view of Ky-lin and his subjects. With deep emotion she murmured, "Oh! But they are beautiful people—beautiful!"

The assembled Neloia broke up at a gesture from Ky-lin and commenced to disperse. Ky-lin went within

and Frank guessed that he had started for the laboratory where Rete would undoubtedly be watching in the Rulgen.

Again relocating and preparing to refocus, Frank warned his audience not to be alarmed at the impression of passing through solid building walls and floors. The view was that of the dome of the building that housed the Loyal Laboratory, and Frank changed the adjustments to include the penetrating energy. As the apparent descent commenced, the watchers drew convulsive breaths. Some even started back in alarm as they seemed to pass through floor after floor of the building. Frank's warning had been of little avail—the impression was too realistic.

The action ceased when the view in the screen became that of a room similar to the one they themselves occupied. There was a duplicate Rulgen, with several of the Neloia dimly visible in the semi-darkness of the room, watching its screen intently. In the far-away replica of their own disc they could see themselves mirrored; their own instrument and a vista of reflections and re-reflections were visible. Good old Jack was there, and Rete, and four of the Urdia! As they watched in silence, Ky-lin entered the room. He walked to the viewing screen and peered intently, waving his hand as a token that he had recognized Frank and could see the company about him.

Frank was happy—speechless with anticipation—but he saw with sadness that Ky-lin had changed a great deal since he last saw him. He was thin and haggard. Beyond doubt he had been through many worries and troubles in the past two years.

Almost instantly a panel in the floor of the distant room was lighted. This was the panel upon which communications were to be placed; a duplicate of the one in their own observation room.

At Frank's signal their own panel was lighted. On it had been placed the first placard, and when it was illuminated they could see the distant watchers smile and nod with pleasure. This placard was inscribed, "Greetings Neloia, from friendly Visin."

Negotiations had opened.

In the disc of their instrument, the communication panel in that little room in Ulderg was brightly visible as a rectangle about the size of an ordinary sheet of writing paper. All bent their heads over this as one of the Urdia knelt before it and commenced tracing bold characters in English. "Greetings acknowledged and returned with gratitude," wrote the hand that stretched out over the panel, "Especial gratefulness to Frank Chandler, and felicitations from his friend Jack and from all of us. We beg speed. Disturbances on Uldur spreading rapidly. Fear little time remains."

At that instant the writing shook crazily, the view twisted and broke. The far-off Rulgen tilted and fell, carrying with it the surrounding people. Jack's face was raised despairingly as he too disappeared in a rain of falling stones and debris.

Back in the little observatory in Washington the group stood in tense, awed silence for a moment. Then pandemonium broke loose. The women sobbed, the men groaned, and the radio announcers dropped their

microphones. They had not spoken a word. Frank actually wept. His fingers shook so he could scarcely operate the controls.

Eventually he got himself in hand sufficiently to alter the focus; the view changed to include the entire city of Ulderg. The scene there was indescribable. Tall buildings crumbled and fell. The palace itself swayed drunkenly, then was literally torn asunder, falling into the public square where hundreds of the inhabitants had fled in their terror. Clouds of dust and of vapors rose from the doomed city.

"Too late, too late," moaned Frank. "My friends are lost. And we can do nothing."

There was no escaping the catastrophe. As they watched, a dreadful chasm opened through the heart of the city, carrying into its depths what few of the buildings and inhabitants remained after the first shock. Almost immediately a burst of flame and billows of red-hot steam belched forth, completely obstructing the view.

Frank had again summoned energy and the whirring of the machine resumed. They were backing away from Uldur rapidly and soon the disc of the planet was within the confines of the viewing screen. The disturbance could be seen, a little toward one edge, as a tremendous upheaval. Canals all over the surface began to open up, to widen into huge chasms like the one that had broken through the city. It was horrible! The planet disintegrated before their eyes. One of the women fainted, her moan and the thud of her body as it slipped to the floor being scarcely noticed by the others, so engrossed were they in the tragedy before them.

The orb receded rapidly now and, as it grew smaller on the screen, it suddenly changed shape in a horrible manner. Awe-inspiring pillars of flame and smoke burst from all over its surface—a great portion broke away, probably a fourth of its volume, hurtling away into space with terrific speed. Behind it trailed a stream of burning particles. A new comet! But it was rapidly lost to their view. Another and still more violent explosion rent the remaining portion asunder. It spread into a huge sunburst, momentarily lighting the firmament with the glare of myriad fragments hurled in all directions and glowing brilliantly as they were consumed by the heat occasioned by their ultra-rapid passage into space.

Then all was darkness on the screen. The mechanism of the Rulgen still whirred on, but Frank did not stop it.

He, too, had slumped to the floor, and when someone snapped on the lights, they saw he was on his knees, hands clenched in his hair, staring at them with eyes that did not see.

Gently they helped him to his feet and there he stood a moment, swaying uncertainly. He beat his fists together in his anguish of spirit.

"God! It can't be true!" he almost shrieked at the stricken group. "Poor Jack. Poor Ky-lin. All my dear friends there. All gone! I have failed!"

Again he tottered, clutched for support. As he fell, Professor Borden and his uncle caught him and bore

the rigid body to a couch in the adjoining room. Frank had fainted.

* * * * *

THOSE of you who are of sufficient age will remember that day in 1942 when the newspapers bore screaming headlines, when the broadcasting system sent forth the news to the entire world, when the subject of discussion on every tongue was the destruction of the planet Mars. Some few of you may even have been fortunate enough to witness such of the phenomenon as was visible to the naked eye of observers in the western hemisphere. You will recall the variance in opinion between the numbers of astronomers who observed the event through their poor telescopes. You will likewise recall that one Professor Borden, greatest of the scientists of his time, silenced all arguments with the announcement that the thing had been observed at close range through the then unknown instrument, the Rulgen. You may have heard vague rumors of life having been seen on the planet, of a possible war between the two worlds, Mars and the earth.

But the actual happenings, of the exploits recorded herein, you have read for the first time. The reason for this is two-fold. During the subsequent illness of Frank Chandler, the remainder of the witnesses solemnly agreed not to divulge the story in detail until all but one member of the party was deceased. Of course the professor was privileged to tell of the destruction as witnessed, but not of the preceding events. In the first place, it was felt that world-wide criticism and condemnation might be occasioned if the story of the Neloia were published—criticism of the inefficiency and procrastination of governments, of the many delays during the two years required to construct the Rulgen. In the second place, Frank had requested that his efforts be kept a secret during his lifetime. He knew that his diary of the happenings during his visit to Uldur had made him somewhat of a hero to the company who had knowledge of his exploits there. But he considered that he had failed in his trust and was extremely sensitive on the subject. The company respected his wishes.

In justice to all present on that memorable evening be it said that the pact was never broken. The few rumors that did spread for a time were based on the wild fancies of imaginative people, not on fact.

Professor Borden associated Frank with himself after hailing him as the inventor of the Rulgen, the remarkable contrivance that soon replaced the huge telescopes in all of our astronomical observatories, and has since given us much intimate knowledge of the heavens and of the various forms of life existing on many of the planets. These two were great friends until separated by the death of the professor, and you will recall the honors that were heaped on the aged scientist at the time. His theory of the cause of the explosions which destroyed the planet was accepted without cavil. Great fissures, he had maintained, opened into the very heart of the planet by severe quakes, had allowed water from the subsurface lakes and streams of the upper crust to flow down into the molten mass within in such quantities as to produce

steam at tremendous pressure, thus blowing the already weakened globe into fragments.

Frank never ceased mourning for his friends, who passed with the passing of Uldur, nor did he ever forgive himself for the failure of his mission. He found happiness and consolation in his work with Professor Borden, who never tired of reminding him that the failure was not his, that the Rulgen could not possibly have been completed in less time, and that even if it had been only a few of his friends could have escaped the disaster. But at this Frank always shook his head sadly at thought of one or two trips of the fleet which might have been made had they finished sooner, and of the thirty or sixty thousand of his beloved Neloia who might have been transported to his own world and to safety.

Perhaps though, in the light of events that transpired some twenty years later, it is better that this highly-strung and sensitive people did not reach us. I refer to the terrible war of 1963 to 1966, which is still fresh in our memories after these fifteen years. Possibly I err in this, but it seems to me that the horrible slaughter and devastation wrought in that period would have caused a great deal more agony among them than did

their sudden and quick destruction in their own homes.

Frank, the youngest of the group, has now left us also and, as the surviving member, it has been my humble privilege to record the happenings as set down. I found great interest and not a little of absolute wonderment in going through the many manuscripts and photographs carried back to our earth by Frank. Much of the story was obtained from these records and from Frank's diary, but a considerable portion has been taken from actual descriptions given to me by word of mouth. Rarely could he be induced to talk on the subject, but when he did his words were always of the virtues of the Neloia, of Jack, and of the geography and characteristics of Uldur. Of his own deeds he never spoke, and those portions of the tale dealing with his achievements were culled from pages in his collection of manuscripts that had come from the pens of Jack, Rete, or Ky-lin.

My sole object in setting down the story after these many years is to convey to you the fineness of character and the unselfishness of him who was called by Ky-lin, "Ambassador Extraordinary," and to perpetuate his memory. If, in some small measure, I have succeeded in this, I am content.

THE END

LIFE

DEAR LIFE, you came so very far

To give your boon to me,
From primal cell and ancient worm,
And fish that ruled the sea;
Through saurian that drowned at noon
And mammal lodged in tree;
Through apish wight and troglodyte
You came so far to me.

DEAR LIFE that came so very far,

You must not leave too soon,
For I who find your presence sweet
Am loath to lose the boon.
But, Life, because your creatures fill
The earth and air and sea,
Too well I know that when you go
You cannot grieve for me.

By Leland S. Copeland.

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 any one 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.

1. What is the nature of the force propelling a rocket? (See page 489.)
2. What element is it supposed that the great scientist, Madame Curie, discovered in X-Ray tubes? (See page 508.)
3. What ancient Egyptian monarch in his views on sun-worship seems to come close to our theory of the atom? (See page 508.)
4. What is the name of the famous ray discovered by Professor Robert A. Millikan? (See page 510.)
5. Can you conceive of a hole in the universe or describe it? (See page 510.)
6. What law is termed the most inexorable law of the universe? (See page 512.)
7. Can you explain the stagnation of equilibrium to which the universe seems to be slowly tending? (See page 512.)
8. In what mineral ore deposits can bacterial influence and action be inferred? (See page 526.)
9. What two properties of matter usually associated in the mind with gravitation, are really independent of it? (See page 534.)
10. In the absence of gravitation, what could take its place in a vehicle moving through interstellar space as regards the actions of the passengers in such a vehicle? (See page 544.)
11. In the absence of gravitation, would mass and weight both be effective in their action? (See page 545.)

The INVISIBLE BUBBLE

By Kirk Meadowcroft



It was with considerable surprise that I received a note from Dr. Sylvester. At college our paths had run parallel for a time, only to diverge when later I had gone on to the study of medicine and he to an erratically brilliant career as a physicist. During the years that had elapsed since leaving the university, he had withdrawn himself even from his closest friends, and it had been rumored that this was due to the sudden and unexplained disappearance of his fiancée. Only from time to time, with the publication of some of his papers, did his name come to us, and always as the storm-centre of scientific controversies.

Now when his note to me showed that he had abandoned to some slight degree his hermitage, I welcomed the opportunity that it afforded and I took care to present myself punctually at his house on the evening appointed. I found the address to be in the so-called "Old Chelsea" district of New York, where the river-breeze from the Hudson refreshed the wide, quiet streets, and where the brown-stone fronts of the old houses still bore witness to the moneyed comfort of their former owners.

Time touches the scholar only with the brush of a light wing and Dr. Sylvester seemed scarcely changed from the grave and earnest student I had known. We dined with the quiet ceremony that he had always maintained, and not until we were seated in the library over our cups of Turkish coffee did he give any hint of the purpose behind his invitation. But after a pause, while the light of the fireplace flickered across the plaster garlands of the high ceiling, he said, "I suppose you are curious to know why, after all these years, I have called upon you?"

I attempted a polite disclaimer.

"Familiarity aside, I need your help in an experiment that will, without a doubt, lead us into fields of knowledge where man has never yet trod. In asking your help, I will not conceal from you that, like all adventuring into places unknown, it is an 'experiment perilous.'"

"You are no doubt familiar," he continued, "with the series of experiments in which Mme. Curie discovered the presence of helium in long-used X-ray tubes?"

As he spoke of those researches that had for me always held a peculiar thrill of wonder, my interest and expectation were aroused to the highest pitch.

"You know too the analyses in which Ramsey and Rutherford failed to substantiate it. But I am sure that it will interest you to know that I have been able, by the use of a technique far more sensitive than theirs,

to repeat the analyses and to verify beyond a doubt the findings of Mme. Curie."

I could not repress an exclamation of surprise at hearing actual confirmation of one of the most inspiring researches of this century. With a smile, he showed that he shared my enthusiasm.

"Let me outline for you very briefly the principles underlying our projected experiments. In following the course of modern scientific discovery, you must have been impressed by the strange circle over which, in the sweep of the centuries, we are returning, with ever increasing wonder, to the truths so long cast aside in ridicule, that the ancient world knew. They had found them not by experiment as we have, but by pure reasoning alone.

"The latest investigations into the structure of the atom have brought us perilously close to the old Greek doctrine of the essential identity of all matter. Our latest studies of electro-magnetic waves have brought us to repeat, with only the change of phrase, what Akhenaten nearly a thousand years before the Greeks, had known and felt in his worship of the Aten.* And perhaps there were even earlier peoples that knew what we are beginning to perceive by our studies of radioactive elements—that matter and energy are interchangeable manifestations of one and the same thing. But even though we know that there are other space-worlds co-existent with ours, we have still been space-bound. The limitation that our own bodies impose upon us holds us prisoner.

"Yet at all times and places in the world men have known that there were strange intrusions of other space-worlds into ours. Some things might even make us believe that, sometime, somewhere, there have been men that understood the laws that govern these intrusions.

Men have disappeared. . . . Do you remember the strange death of the young interne at St. Francis' Hospital a few years ago?"

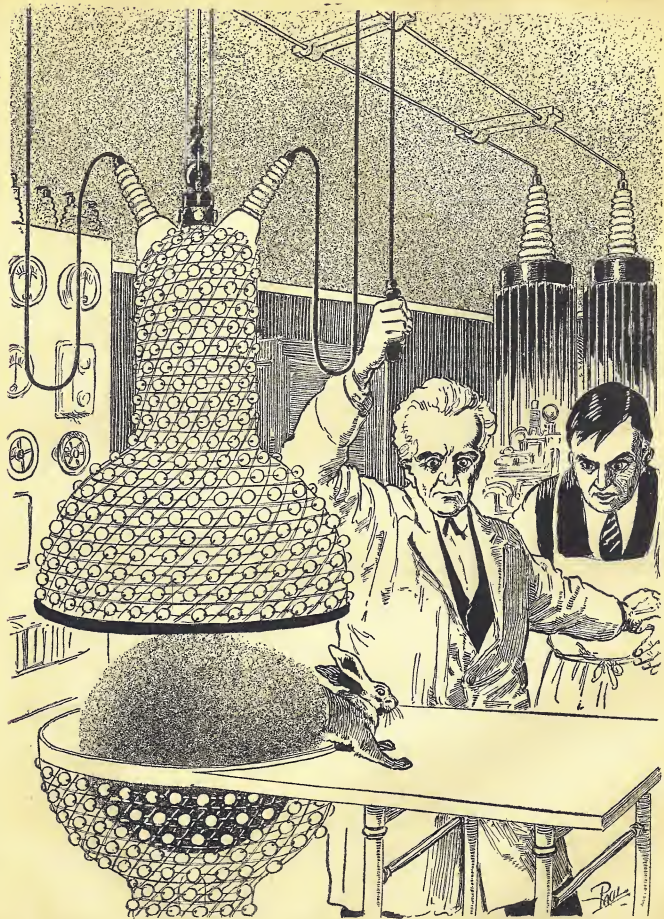
"He was struck by lightning, was he not?" I asked.

"So it seemed," he replied. "He was crossing

the courtyard of the hospital during a heavy thunderstorm. He was in full view of a dozen doctors and nurses at the window when the flash came. But no trace of his body was ever found.

"Are we not justified in supposing, by the analogy of the reversibility of reactions in chemistry, that the boundary lines of space and hyper-space may not be so rigidly drawn as we have supposed? That is the

* Egyptian Myth. The solar disk, the worship of which Amenhotep IV (d. ab. 1397 B. C.) sought to make a supreme cult of Egypt; because of this effort, he is sometimes called the "heretic king."—(Webster.)



As we approached the tube, we saw forming in its center a small bubble, black and with no trace of lustre.

research that will be the subject of our experiments."

The clock struck a late hour and carrying with me a whirling vision of this great spatial interflow, I left the house, to return next day for the commencement of our work.

THE laboratory was a vast room that formed the whole upper floor of the house, and one end of it was completely filled with what seemed to be a series of giant transformers, of which the heavily insulated tops were almost lost in the shadows of the ceiling. A great switch-panel held a number of meters and on a large table was a complicated arrangement of apparatus, most of it totally unlike anything I had ever seen before. Only a great tube, a yard in diameter, seemed to resemble in some sort an X-ray tube, though it was covered all about with what seemed like a fantastic bird-cage of wire. Set near the table were several booths, heavily sheeted with lead, and two or three high screens covered with the same metal. Lastly, in a protected corner, were several hutchboxes of rabbits.

"First of all," said Dr. Sylvester, as I turned to him in bewilderment, "let me impress upon you, that under no circumstances must you leave the shelter of your booth until I give the word. The intensity of the rays that will be produced at one stage of the experiment is tremendous. The concentration of power within the tube is designed to set up a condition of excessive strain in the portion of three-dimensional space in which it acts, a strain that I have reason to believe, once set up, will remain more or less permanent. Each booth is provided with a periscope and intercommunication phone."

While he spoke he was busy at the door of the rabbit hutch and taking up two wicker baskets he enclosed a rabbit in each. He gave one to me, and pointing out the booth in which I was to stand for protection, he entered his own shelter.

I found the interior of my booth by no means so cramped and dark as I had expected. On a little screen the image of the room was distinct and bright; a small pilot-light burned above a control-wheel and through a loud-speaker telephone I could hear the voice of Dr. Sylvester.

"The booths are provided with duplicate controls," he said. "In case of accident, seven complete turns of the wheel will shut off the current."

As I watched, the great tube began gradually to glow, at first dully, then with increasing light until the violet radiance was dazzling; then suddenly it stopped, but a moment afterward the whole room seemed bathed in fantastic flickering light—light that seemed to emanate from the objects in the room and flow over their surfaces in a play of rippling color.

"Almost all substances seem to fluoresce under the impact of these rays," said the doctor.

But this light also passed as the increasing intensity of current continued to hasten the cycle of the emanated energy. The tube continued dark.

"Now the current is at its maximum," came from the telephone.

I saw Dr. Sylvester's rabbit leap out from the door of his booth and scuttle across the laboratory floor.

"Now we can safely leave our booths," were his next

words. "At this intensity the rays very nearly approach the magnitude of the 'cosmic rays' of Millikan. They are apparently harmless to life but they seem to be closely associated with the dimensional relations of matter."

As we approached the tube we saw forming in its centre a small bubble, black and with no trace of lustre. No light could pass the etherless space that had been blasted apart under such tremendous force. As we watched, it grew until it nearly filled the tube.

"What is it?" I exclaimed.

"You might call it the 'Quintessence of Nothing,'" he replied. "It is a Hole in the Universe. Let us return to our shelters while I shut off the current."

The tube remained dark. No flickering fluorescence passed over the room. Whatever rays were generated in the dark heart of the bubble were powerless to pass the space that was other than the space we know, and perhaps their titanic and struggling insulation hastened the disintegration of that three-foot portion of what had been our three-dimensional world.

The afternoon we spent in writing a complete laboratory record of our morning's work and by evening we were both exhausted, with the nervous exhaustion that follows excitement.

That night a series of terrific thunderstorms swept over the city and my sleep, in the intervals between the climaxes, was troubled by dreams in which the bubble—now grown large—assumed fantastic shapes and I saw it, as I had not in my waking hours, as a menacing thing. But in the morning with the storms gone and the summer sunlight flooding my room, such thoughts left me. I dressed and met Dr. Sylvester at the little restaurant he sometimes frequented, breakfasting heartily and at leisure, as though the day before us were concerned with no important matter.

On returning to the house we found a crowd gathered about the entrance, with two fire-patrol wagons at the curb and numerous helmeted firemen moving in and out through the crowd. We hurried. The crowd was mainly of the curious, but there were some who were recognizable as neighbors and of these, two or three women, bareheaded, answered our query at the same time.

"It's the housekeeper's little boy, sir. He's lost and no one knows where—but they could hear him cryin'."

"They thought he'd crawled under the stairs or somewhere;—but then he might 'ave gone under the floor—it's an old building, sir—and they got the firemen to help with their axes and ladders."

I saw Dr. Sylvester's face set with sudden concern. As we stood there silent, we could hear from time to time a faint wailing that seemed to come from very far off, or to be muffled by some enclosing barrier. There was a murmur of sympathy from the crowd. The wailing grew nearer, more plain.

"They must 'ave found him," said a woman. "They must 'ave found him—but funny he's still cryin'—"

The sound grew plainer—seemed for a moment almost at our sides, then passed away from us, going farther and farther from the building till it died away.

"Mother av Moses!" said one of the women. "What was that?"

Then the firemen came out, empty-handed. The boy was not to be found.

"That noise couldn't have been him—must have come from some place else," they reported.

Gradually the crowd dispersed, and as soon as we might, Dr. Sylvester and I went upstairs to his laboratory. There everything was as we had left it the night before—but the bubble was gone.

WE stood for a moment looking at each other. I think we felt that there was no need to question, that we both understood in a dim way the connection between the events. But whatever the horrible explanation might be, we knew that in our work lay the immediate necessity.

Sylvester seemed more shaken by it than I; yet I could see that his brain was working more clearly and more rapidly than mine. Very suddenly he began to speak, in a voice I had never heard before.

"I have never told you—nor anyone—how I lost Marjorie. Please to consider this aside from sentiment as data for a scientific purpose, nothing more. I was walking down the road that led to her house in Hazelton when I saw her, a hundred yards away, coming out of the gate of her front lawn. She saw me and, waving, started to meet me. About half way she seemed to stumble. I thought she had turned her ankle and ran forward to help her. At that instant she disappeared—vanished—before my eyes. I came up to the spot where she had been—there was *nothing*. The surface of the road was solid—the edges of the road were clear of bushes—I had not taken my eyes from her. I ran to the house. Her family from the porch had seen her leave the gate—else I should have thought that I had gone a little mad. And when I went back to the road, I thought I heard her calling me. That was all. What happened afterward does not concern us now, but this much it is necessary for you to know in case you may be obliged to carry on these experiments alone. Now you see why we must finish the work."

In a few minutes he pulled himself together with what must have been a tremendous effort. His next words were concerned with the technical details of our work.

"We must, above all," he said, "avoid the possibility of another bubble escaping from its bonds. We must make a cage that will be sufficiently powerful to hold it. I believe that we may, by a change in the confining screen, attain this end."

That day I remember vaguely as a day of feverish work and dreamlike wonder. In irrational sequence came phenomenon after phenomenon—strange, unimagined and inconceivable—till the world in which we had lived became remote from our consciousness and we lost all touch with the reasoning of our accustomed universe.

In a quiet haste we wired a new retaining screen, but this time with additional guards at its intersections—tiny glass spheres containing substances powerfully radio-active. With this new screen in place of the old, we made a new bubble and with terror saw it engulf a

rabbit that we placed there as a hasty victim in the cause of science. To our wonder we saw the bubble, having absorbed into its nothingness the living object, slowly lose its dense obscurity and become less and less—saw it become a shadow—tenuous—saw the beginnings of translucency, as though by some substance newly dissipated through it—and then to us in the silent laboratory came the screams of the animal, but very faint.

"Then whatever is caught in the damned thing must be—" began Dr. Sylvester and broke off with horror in his voice. We were silent. We both understood the significance of that slow clearing of the bubble. We cautiously loosed it from its retaining current, keeping ready at a touch sufficient magnetism to recapture it. At its release the bubble, now only a shadowy gray, flattened suddenly,—assumed an amoebic form and motion and with a queer flowing, undulating movement, sent out strange pseudopodia (a sort of extension of the central mass) that seemed to feel and grasp. Dr. Sylvester took a small tube of radium, fastened to a glass rod, and with this he drove, as it were, the strange, shapeless thing about the floor. Once he thrust the rod into its center and for a moment it assumed again its rounded shape and clung to the rod.

Another rabbit was placed near it. As by some attraction the bubble moved toward it—a fat pseudopodium seemed to envelope it with a single motion. Now the sounds from the bubble were of both the rabbits but the bubble itself grew clearer and clearer, till it became invisible. Almost as it disappeared, we led it to its cage and secured it with the current.

I do not know how much more Dr. Sylvester understood than I the strange translation of these solid atoms. I only know that by the evening his face showed a grim despair, as by one means and another, physical or chemical, we had endeavored fruitfully to penetrate that enigmatic space—to render visible those living things that had so suddenly and so completely been translated into it. We photographed with lenses of glass and quartz, before screens diffusing every sort of ray. These photographs I took pains to develop and examine alone, and Dr. Sylvester, as if accepting the intervention as kindly meant, made no objection.

It was as well that I took this task upon myself, for at midday of the third day, among a series of plates hopelessly blank, I came upon one taken, as the marks showed, by the light of a powerful spark, that showed a thing of horror—bizarre—contorted, grotesquely and agonizingly misshapen—writhing forms that filled the whole space of the bubble. I scraped and hid the plate without further ado and reported "No result."

From that moment I felt that there could be only one ending to the affair. And when we had worked late into the night without result, I saw that the transference of objects into the strange universe was a reaction that could proceed in that one direction only—that some strong balance favored the unknown side.

FOR three days we worked unceasingly. On the evening before the fourth day we sat again, with our eyes burning from fatigue, in Dr. Sylvester's library over coffee—much coffee.

He seemed at first almost too wearied to speak but after perhaps fifteen minutes of silence, he began in a tired, quiet voice, to summarize the results of our work.

"We have discovered by my synthesis the factors necessary to produce a disturbance of spatial relation. We see that they may occur in nature; that under certain conditions, by the aid of lightning as well as by my tube, there may be produced the globules of hyper-space, which then seek each other out—flow together—and travel in vague and erratic fashion, as they may be drawn here and there by one influence or another. They seek each other out, not by any attraction but by the simple and all-powerful law of chance—the result of an infinity of chances—the most inexorable law of any universe. They seek each other out and flow together;—you will remember that.

"The experiments in which we attempted to *reverse* the disturbances of space were a failure. I now see more clearly why they could not have succeeded. I can explain it only vaguely perhaps, for our science has as yet but few words to express or explain such phenomena, but briefly, it is this:

"There are in the universe certain motions and reactions that are *unbalanced*—that tend toward a certain end from which nothing can divert nor arrest them. Such is the general rush of the whole known universe through space from an unknowable start to an inconceivable goal. Such is the gradual dissipation of energy throughout the known universe—the slow but inexorable reduction of unequal centers of force to an incapable stagnation of equilibrium, which no factor of this universe shall ever be able to break. And one aspect of this is shown by the elements of higher atomic weights. Now the fusion-point is at uranium and radium—who can know at what unknown element it was in time past, or at what elements it may lie in the future, till the reduction shall be complete.

"This is not new;—in this we have found no more than others before us have found. Our great discovery—and it is for humanity a hopeless, barren thing,—is that, as these great progressions exist in our universe, so there is an interspatial flow—from the Known to the Unknown—as inexorable as the others.

"And since it is inescapable, it will be inadvisable to

publish it to humanity; that knowledge might produce events of unnecessary horror—if it were not utterly disbelieved. I shall, therefore, destroy all our notes and tomorrow we shall together demolish my apparatus. It was just as well, perhaps, that you destroyed the one successful plate. I rather fancied that you might. It was kind though to spare me, but needless. In these last years I have known that strange things existed. I have watched and sought for them—and I have *seen* them,—beyond the utter limits of horror.

"Now let us, in God's name, leave off this unhappy experiment for tonight. We are both in desperate need of sleep. Take the couch in the small room and I will take that in the library. Good night and good rest."

The night passed as a single moment and I slept with complete loss of consciousness till next morning when the sun was high. I saw at once that it was late and tiptoed to the door of the library to see if Sylvester were yet awake. The room was empty, the couch was bare. I thought that he must have gone early to his laboratory.

And so he had—for just as I caught sight of a paper propped against the lamp on the library table, I heard, or thought I heard, his voice as from far off.

"Frank—old man—I've gone—I won't forget—"

The room was empty. I rushed to the laboratory. It also was empty, but the chemical salts on the shelves, still flickering in their luminous activity, showed that the full force of the current had been in use but a moment before. I locked his laboratory and his rooms and, somehow, got back to my own house. There I lay for a week, delirious with fever—prey of the most unheard-of phantasms. There was no one of those that tended me that did not believe me a little mad.

On the first day that I was able to go about I went alone to Dr. Sylvester's rooms and destroyed all of the apparatus of his research. He himself must have burned all his papers on that last morning, for I found none anywhere in his rooms. As I left I told the janitor of the building that Dr. Sylvester had been called suddenly away, that he might clear the rooms of what rubbish was left and re-let them as soon as possible. Then I went out where the air was clear and fresh.

But now I know that the sound of wind in the trees at night is not always made by the wind.

THE END

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The publishers need a quantity of back numbers of **AMAZING STORIES** for April, May and July, 1926 and September, 1927.

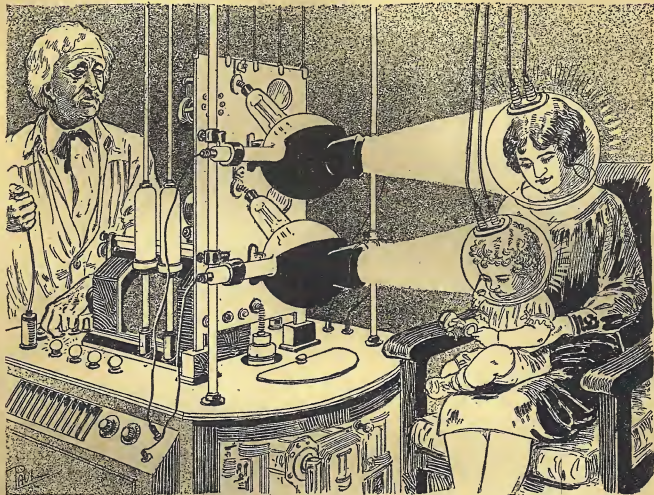
If you have copies of these issues, and are willing to part with them, please be good enough to communicate with us. It will be appreciated.

THE PUBLISHERS

UNLOCKING *the* PAST

By *David H. Keller, M.D.*

Author of "The Revolt of the Pedestrians," "The Biological Experiment," etc.



"Of course you will have to wear a mask also, and probably the treatment will have some effect on you. I think it would be very interesting for you to take it with your daughter."

I WILL never permit anyone to experiment on my baby!" Anise Howes, the companionate wife of Robert Howes was speaking. There was no doubt that she was in earnest and as a result her husband moved restlessly around the room, while the old scientist twiddled his fingers and tried to act as though it were a common experience to face an irate female.

"I assure you, Mrs. Howes," he said in defense of his suggestion, "that the little one will suffer no physical harm. I would be the last one to injure your little daughter in any way. I have gone over every step of the proposed experiment with my co-workers and

we are sure that it is harmless in every detail. Of course the child will be rather unusual for a few years, but when it reaches maturity it will at once assume a position of renown in a scientific and educational world. As the first child who has attained to these wonderful stages of intelligence, Angelica Howes will make a name for herself that will go down in the history of our universe. Her name will be recalled when mine has long been forgotten,

just as millions know the Venus of Milo, while only a few have any idea of the man who carved her from the solid block of stone."

"Mrs. Howes is just a little nervous," said her husband soothingly, "and it is only fair to state that we have had enough financial

*H*ERE again we have the perfect "different" story. Dr. Keller has picked a subject which, to the best of our knowledge, has never been used in Scientifiction before, and it makes a most interesting exposure of heredity in general. Also, the thing described in this tale is not as impossible as you might think, because we do know for a fact that instinct is inherited, and while there may be a gulf between instinct and the complicated phenomenon that we know as language, yet the gulf may be only apparent. Dr. Keller's story will give you a good deal of food for thought.

trouble lately to make her so. There was sickness and then our home burned down, and I broke my arm and the baby was born and we did not have cash to properly provide for her nurses and things like that—so, she is just a little nervous, and then, Angelica is her first child, and you know how it is with a first baby. Perhaps she would feel better about it if you explained the entire procedure to her and showed her positively that it would not injure the child in any way. You would listen to it all, wouldn't you, dear?"

"Oh! I will listen politely, but will make no promises," said the young wife. It was evident to all that she was rather tired.

The old scientist settled himself in the leather arm chair and started to talk as though he were addressing a class at the University.

"The psychologists have contended for years that there is such a mental process as inherited memory. Yet, since the days of Jung of Vienna, many of us have believed that everything a man and woman know is transmitted to their children and grandchildren and so on through the generations, increasing in intensity, as each pair of parents add their specific acquired knowledge to the previous store of inherited intelligence.

"As a hypothesis, this has been hard to prove. All of us have experienced the peculiar psychic sensation in reading a book that somewhere, sometime, we have read it before: Or we feel that we have performed a certain act before, or visited a certain shop in a European city when we know positively that this is our first trip across the Atlantic. When these sensations are subjected to careful analysis, they become difficult to evaluate, and can be put to no scientific proof.

"In philology, however, we find a valuable aid to prove our thesis. For years we have been making a careful study of the sounds made by babies from the day of their birth. It used to be thought that these were just haphazard sounds, made accidentally, and with no meaning. This idea was caused by the fact that practically all parents had only a knowledge of some modern language. When the sounds were studied by linguists, a very astonishing thing was determined; they were not sounds but words from ancient languages. A baby spoke words from languages; languages long dead, and it was called baby talk because no one had intelligence enough to understand it. We have been able to identify words from the old Coptic, Aryan, Semetic, Grecian, early Latin, German and the English of Chaucer. There were never connected sentences, and only occasionally were the words used in appropriate connection, but, nevertheless, the sounds were words and correctly uttered as far as the vocal effort was concerned.

"Where did these little babies learn those words? Not from their parents, but from ancestors hundreds of years to thousands of years remote from our time. That is the only logical answer. The sounds came up from the well of antiquity. Evidently a very small percent of the memories cross the threshold of consciousness. Another interesting fact is that they come

in chronological order. The oldest languages are hinted at in the earlier months of life, and as the child grows older the words become more modern, till finally, at about the age of five or six, there is a complete surrender to the language of the parents, which, in our land, is modern English.

"We have asked ourselves if it is fair to assume the existence of other memories besides that of world sounds? Can experiences be recalled? Emotions relived? Educational developments of the past taken advantage of? If so, what a wealth of fact would be added to the knowledge of modern man. There are thousands of books which we know existed but of which today we only possess the names. Suppose we found a child who was descended from one of the old librarians; who could remember the contents of those long lost volumes? How interesting to find a little one who could tell us his recollections of the actual building of the pyramids! Placing the problem in a modern setting, suppose we were able to have living descendants of Thomas Jefferson and James Madison tell us who actually wrote the Declaration of Independence.

"Even in such a matter as personal family history, think of the possibilities of the development of such a memory. Every person so gifted could dictate page after page of his ancestral line. There would be no guess work then as to what service your ancestors rendered in the cause of the American Revolution.

BUT let us consider the matter from the standpoint of the common good. There would be no more need of elementary schools. Think of the time and money spent in teaching each generation to read and write. If every child was born with a perfect memory, the child of literate parents would know all that his parents knew and could start with that knowledge. The son of an Edison or Ford could simply continue where the father had stopped when the child was created.

"Invention, science, learning in all its branches would advance with tremendous strides. Genetics then would be more than a theory. A musician married to a musician would produce a child having all the ability of both parents from its birth. There would be no need of prolonged years of preliminary training. Specialists could be produced at will. There would be families of skilled surgeons, descended from the Mayos; large clans of expert aviators of the family of Lindbergh; authors and poets arousing the enthusiasm of the world and bearing the name of the great.

"With all this in mind, we worked for some method of tearing down the tremendous barrier between the past memories and the present consciousness. What we wanted to do was to enable the child, in some way, to remember. If it could remember a few words of Coptic, why could it not recall two thousand? If it could speak perfectly one word of ancient Semetic, why could it not form connected sentences? If it could remember a vocabulary, why could it not recall events, campaigns, literature, social life?

"Yes! That was our aim! Give us a dozen babies able to talk from birth. Have each child constantly

attended by trained philologists and skilled typists. Have every word taken down. If a child of two could speak the Latin of 300 B.C., it could answer questions in that language. The present gaps in history could all be filled in. The only limitation to our increase in knowledge would be our inability to know what to ask next.

"And after we had shown what we could do with one baby, with a dozen, we should be able to have a law passed that would give us the right to give every child such a treatment the day it was born. The first inarticulate cries might go back to prehistoric man. We might learn of the stone age, the ice age, the age of the missing link. Personally, I am not so much interested in anthropology, as I am in history. We have here in the United States three hundred persons who are directly descended from Charlemagne. Suppose we could get a few babies in those families to tell us just what the great king actually thought and did?"

"We have worked on the problem from every point of attack, and finally we believe we have found the solution. There are so-called silent areas in every brain. They can be destroyed without seriously injuring the mental life of the person concerned. We felt that these silent areas were really great storehouses of the facts of the past, enormous libraries on whose shelves reposed, in orderly sequence, these memories so far inaccessible. The means of connecting them with the active brain seemed to be a matter of molecular vibration. We worked on that and finally one of us thought of passing radium-acturium B rays through a vessel filled with neon gas. The rays were then focussed on the subject's brain. We found a man who could not read and write, never having had the advantages of an education, but whose grandfather could sign his name. In many ways our subject for experiment was an idiot. We had him spend an hour in this special atmosphere, supporting life in the meantime by oxygen tubes. When he recovered consciousness, we set him at a table and placed a pen and inkwell in front of him. He wrote on a paper and he wrote his grandfather's name. Not only that, but the signature was identical with his ancestor's.

"We felt then that we were on the track of a wonderful discovery. We were ready to start with a baby, and we wanted a baby of whose ancestors we could be reasonably sure. We learned of your child. Your ancestral lines are well known for at least five generations. Here and there have been peculiarly impressive individuals, men and women who for some reason stood out in a striking manner above their fellows. We wanted to use these ancestors as controls. If the facts remembered about them were 100% accurate, it is reasonable to suppose that the recalled memories of a thousand or two thousand years back are equally accurate.

"We had various social agencies make a thorough investigation of your family life. While you had formed a companionate marriage, it was evident that you belonged to the two per cent group of such marriages, who had made a failure of birth control, and had a child before you were financially able to provide for one. I do not want to embarrass you by

mentioning your genteel poverty, but I can say that we are prepared to secure you and your husband a pension of twenty-five thousand dollars per year for the rest of your life, if you will allow us to study your child. I can assure you that it will not come to any harm; in fact, it will be the constant object of the most profound solicitude. We all do all we can to maintain it in perfect health. It seems to us that you have nothing to lose and everything to gain by giving us the permission we ask to observe your child under these unusual and phenomenal conditions.

"Now, I have told you all that we have in mind. I have been very honest with you and have concealed nothing. Surely you two parents will give your permission and sign these papers?"

Robert Howes looked across at his wife and he thought of the way she had worked since she had become his wife and of her daily toil and her desire to grow beautiful roses rather than cook and wash dirty dishes, and he said, without much hesitation:

"I am willing to sign the papers."

His wife, Anise Howes, who had been a Fannin before her marriage, looked across the room at her husband and to her mind came the thoughts of the winters he had passed without a fur coat and of how he had gone without books, and without leisure to write yet other books, so that he could keep a house over and around her and their little one, and she realized what the use of twenty-five thousand dollars would mean to him, and how he would try to buy her jewelry while she would actually buy him his long-coveted Casanova.

"That would be a wonderful name for my heroine married life, the tears came to her eyes, making her all the more beautiful, as she said:

"If it will not hurt the little one, I also will sign the papers."

Then the old scientist produced a legal document which sparked with whereas and therefore and he showed them where to sign; he gave them a copy and carefully replaced the original in his pocket; he told them that when all was ready he would come for the child and that he wanted them to go with him, so they could see that nothing of harm happened to it.

And when he was gone from the house the young man and his wife sat talking it over, and each one lied to the other as to why each had signed the paper. Robert said he wanted to have leisure to write his great novel, and Anise laughingly said that now she would be able to grow her roses, while a nurse-maid took care of the baby and a servant prepared the meals. Then they went to the room where little Angelica lay sleeping and they stood by the side of her crib, which had a rabbit eating a carrot painted on it, and the father said:

"She is certainly a beautiful baby."

"She inherited her beauty from you," insisted the mother, but Robert silenced her with noiseless kisses. So they left the little baby to sleep, while each went on his and her way to prepare for the morrow.

That afternoon roses came for Anise, and with them a Spanish shawl, black, with such red roses as never grew in Andalusia. The little wife amid smiles and tears dressed for supper in her wedding finery, and as

a special treat had ice cream and lady-fingers to add to the usual soft-boiled eggs and fried potatoes.

"Why did you borrow money to buy more things for me?" she demanded that evening as they sat before the fire.

"That was my money," he replied bravely. "It was the gold pieces I sold my story for."

Thus showing her for the millionth time that he loved her.

Happy but frightened because of the morrow they went to sleep.

"I WANT you to let me hold the baby while she is receiving the treatment," begged Anise Howes. "She is just a little roty-poly but to be alone with the oxygen apparatus on will frighten her. If I hold her, she will think it is a new kind of game and the only thing that will bother will be her gurgles of delight."

"There will be no objection to your doing that," said the old scientist. "Of course you will have to wear a mask also, and probably the treatment will have some effect on you. I believe that it would be very interesting for you to take it with your daughter. It may be of value to her. You will be able to act as an interpreter for us in case she speaks a language we are not prepared to understand."

"I am glad my wife asked for this privilege," said the husband. "Angelica is just a little thing and cannot talk yet but she has lots of common sense and there is no use of frightening her if it is not necessary. Can we see the treatment?"

"Assuredly! But there is nothing to see. Through the observation window you see a chair and a few rubber tubes. Later on there will be a peculiar green light added to the sunlight. That will be all. In a half hour we will be through. Then I would advise that the three of you keep quiet and let the child sleep as much as she can for the next twenty-four hours, after which we will start with our observations."

In a short time the three were back in their little home. The man had resigned his position and was already happy with his old Corona and a pile of white paper. His wife had cleared the dining-room table of dishes and covered it with catalogues of roses.

"I am going to order a half dozen Emily Gray roses," she announced to her husband, but he was so busy with the beginnings of his new novel about life in Spain that he did not understand her.

"That would be a wonderful name for my heroine from Cordova," he replied, unconscious of what he was saying.

"It is the name of a rose," she sighed, hopelessly wondering why he never could show interest in her love for the beautiful.

Later he cried:

"Listen to this paragraph." But she murmured: "Wait till I finish this catalogue."

So the day passed, and the night came and they put the little baby to sleep and told her that on the morrow she was going to have a fine nurse with a starched cap to nurse her. Then Robert Howes told his wife that he would go out to the kitchen, so the noise from his

Corona would not worry the baby, for he just had to finish a few chapters of his book before he could sleep.

This left the mother resting on her bed, while a few feet away, in the next room, the little Angelica slept.

"MOTHER Dear!"

Anise sat up on the bed, and wondered if she had been dreaming. The call was repeated, and this time there was an anxious quality added to the soft tone:

"Mother Dear!"

And the woman knew that it was her baby, starting to talk in English. She lit a candle and almost ran into the nursery, calling as she went:

"Mother is coming to her Angelica. Don't cry. Be a brave baby."

She found the child sitting up in her crib, a look of worried maturity on her face.

"Where is father?" the baby asked.

"He went out to the kitchen to write. He did not want to wake you."

"Is he writing that novel about his great-great-grandmother in Spain? The one he talked of so often before you were married?"

"Yes, I grieve so. It must be the same one, for he has begun it fifty times and never finished it."

"I wish he would let me help him. He made so many mistakes in it. For example, he always made her a brunette and she was a lovely blonde."

"How do you know?"

"I cannot tell. It is all so strange. Something happened to me and now it seems I can remember everything. I was her daughter and somehow I was great-great-grandmother also and a lot of other people I am just beginning to remember. But I remember her well. She was born in Sweden and her husband met her while he was Ambassador from Spain. She was a lovely lady though she always sighed for the snow-clad mountains of her native land."

"Don't talk any more tonight," begged the anxious mother. "Just go to sleep and we will have a wonderful visit with each other tomorrow."

"I cannot sleep," replied the little baby. "There are too many things on my mind. A memory comes to my consciousness like a wave dashing against a rock-bound shore, and back of that wave are other waves, clamoring for recognition, and still more, and I know that far out on the boundless ocean of the past the water is surging on and ever on to me, as I sit here in my crib, and every year and every moment of the past comes vividly to me on the crest of the waves like driftage from the Sargasso Sea. How can I sleep when there is so much to think about! I used to have vague dreams: you recall how I used to cry in my sleep, but now the dreams are realities and it is so easy to talk and tell you about them. Can you understand me? Would it be better if I talked in Spanish or Latin?"

"Where do you get the words from, Angelica, and the poetry of it all? How do you know about driftage from the Sargasso Sea?"

"I thought you knew? About the encyclopedist and the poet?"

"Of course! My grandfather spent years on the Century Dictionary. I recall that now, but there never was a poet in our family."

"Not in yours, mother, but in father's. The daughter of the blonde from Sweden. I recall my life in her so well. At sixteen she spent a summer in Italy and there she met a poet—and was rushed home to marry a stately Spaniard—it was a blot on the family but it made us all poets."

"Baby! Baby!" cried the anxious mother, "Please go to sleep. Such things are too serious for little tow-heads."

"I will try to sleep, but I cannot help thinking."

The mother kissed her baby, tucked her in, and walked thoughtfully out to the kitchen to talk to her husband. She found him asleep with his head on the table, the typewriter pushed to one side. In the machine was a page of paper, half written. She read it with interest. The first paragraph described the Spanish heroine. She was a heavy brunette, with masses of black hair—"like midnight, and her eyes were stars in heaven."

Anise trembled as she saw that he, at least, was blessed with the privilege of forgetting, even though the poet ancestor had made his impress on the minds of all the men who came after him. She softly ran her fingers through his hair as she whispered:

"Go on sleeping, and when you wake write again about those dream-ancestors, and be thankful that they are as you wish them to be, instead of seeing them as I am beginning to see mine."

She went back to the nursery and sat down in the rocker by the crib. Angelica was asleep but there was no sleep for the mother who was beginning to remember. The scenes were not clear and there was a good deal of scatter to them. Some were pleasant and others made her shiver, and start to pray. It was not only that she saw what had happened to her ancestors, how they lived and loved and died, but in some way she felt that she herself, in them, was re-living their lives. She tried to concentrate on individuals, and it seemed that she could remember almost everything about them up to the time she had been born, and then she could only remember what she had seen and heard about them. Another psychic phenomena that puzzled her was her sex, for in some generations she had been a woman and in other periods a man, and as she tried to evaluate this, she realized that she was as much male as female, only for the time being her spirit was in the body of a woman, and stranger yet, there seemed to be a time when she was both sexes in the same body, only then she was some peculiar kind of reptile, and she prayed in her despair.

"Not that, oh, God! Please spare the baby and me that memory. Let us only remember the human and the kindly things about our past."

In her anguish she remembered a habit of her youth and knelt to pray, and as she was on her knees by the crib, Angelica awoke with a cry.

"Mother! Are you there?"

"Yes, Dear."

"Do not leave me, Mother."

"I won't, Dear."

"Can you remember as I do, Mother?"

"Perhaps, Little One."

"I hope not, Mother. I do not want you to remember as I do."

"Why not?"

"Because it is too horrible. It is life, Mother, but it is so brutal. It was the way our ancestors lived, but it was a hard way. You thought I was asleep but I was only keeping still, with my eyes closed, looking at the memories. So many of our people lived unkindly and died unhappy. To see them poisoned and burned and killed in war was hard enough, but when they had a few days when they might have been wonderfully content and satisfied, those poor people quarreled—about trifles. I know all about it because it seems that I am always the one who was unhappy. In all those previous lives, I was often cold and hungry and ragged, but there was always a possibility of attaining peace and a place in the sunshine if we could have kept on thinking that we loved each other—but we forgot—" The Baby started to cry. "We forgot, Mother Dear; it was not because we meant to be cruel to each other, when everybody around us was also being cruel to us. It was just that we forgot. If we had been able to remember, life would have been so different in spite of the storms."

Anise wrapped her soft arms around the softer baby.

"Do you think we shall be happy because we remember?"

"I fear not, Mother Mine. In fact, I know that we shall not. We will remember too much and besides the ability to remember will not keep us from mistakes. I remember before you married father. I was both of you then. You used to quarrel and kiss again with tears, and you promised that you never would hurt each other again, and yet you did. The memory of the past mistakes was not sufficient to keep you happy all the time. Would a complete memory of the life of five thousand years help? No! It would drive the world to despair as it will you and me, unless we find some way of escape through blessed forgetfulness."

"For more of our memories will be bitter than sweet. Life is like that. There was no golden age in the past. Our race is climbing heavenward but there is still mud on our feet and blood on our hands. I wish, Mother Dear, that I was just a little ignorant baby once more."

"And so do I wish it, dear child," echoed Anise Howes.

She stole back to her bed and tried to sleep, and as she lay there she prayed for the thing she wanted most, and as she prayed she saw an enormous blackboard in front of her and on it was written all that her ancestors had ever known and done and thought, and as she saw the record, she closed her eyes and refused to look, yet through the closed lids the images burned into her mind. Finally she looked again, and now the board was clean save only in one little corner, and she knew that record to be her own life; yet here and there on the board were little remnants of past centuries.

Knowing that her prayer had been answered, she fell asleep.

It was morning when she awoke. Her husband was deeply dreaming by her side. Stealing out of bed, she went to the nursery. The baby awoke, was gurgling and playing with her toes. She laughed as she saw her mother come to the crib.

"Goo—ah—goo," said the little Angelica.

The mother picked her child up, laughing and crying tears of joy.

"Oh! Darling! I am so glad you are just an ignorant baby again."

"Ah—goo—goo," cooed the little one.

For some reason the wife decided to keep the events of the past night from her husband. Of course the old scientist would be disappointed, but no one could blame her, and the pension was assured even though the experiment had been a failure.

Breakfast was as usual.

They were hardly finished when the bell rang. Mrs. Howes, servantless, answered the door's summons. There stood the old scientist and a trained nurse and a very efficient looking female, who suggested a stenographer.

"Come in, Professor," said Mrs. Howes.

"We have no time," answered the scientist, and it was evident that he was excited. "It is past eight, and we are all anxious to start the experiment. Please bring the baby at once and come with us."

"I am sorry that I cannot go with you, Anise," said her husband, "but I have to go down to the office and

resign my position. I want to go and see a publisher also and see what I can do about selling my new book."

The mother looked at the two men in astonishment. "I do not understand!" she said.

"But don't you remember?" asked the old scientist. "You and your husband signed papers yesterday permitting me to perform certain experiments on your baby. Everything is all ready at the laboratory and we want to begin at once. Please get the child."

The determined woman ran to the nursery and picked up the little Angelica and returned to the front door. The mother held the child tenderly but it was a grip that only death could have parted.

"You had better go and find another baby. No one shall experiment with my child!"

The two men looked at each other.

Then the old scientist took the two women and walked back to the waiting automobile.

Robert Howes looked at his wife. He gave a little sigh:

"I must hurry on to the office, dear. The boss comes early and always expects to find me there waiting for him. I wish that you would dust off the Corona and put it back in the case, and put the paper away in the bookcase. Good-bye. Take good care of Angelica. I love both of you."

"On your way home," said his wife, "stop at the new store and get a pound of hamburger. They sell it cheaper there."

THE END

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Results of \$300.00 Scientifiction Prize Contest

In our April issue, we announced a \$300.00 Prize Contest. We stated then that **AMAZING STORIES** wanted a symbol for Scientifiction.

It was pointed out that Scientifiction is a new and distinct movement in literature that is gaining more impetus as the months roll by. There was a time when a Scientifiction book or novel was a scarcity. Now, with **AMAZING STORIES** Monthly and **AMAZING STORIES QUARTERLY** championing the cause, Scientifiction has excited the attention of hundreds of thousands of people who never knew what the term meant before. More than that, it is a distinct departure from the sex-infested novels and books that are so prevalent today.

The success of Scientifiction in general means but one thing, and that is, the public wants a change and wants it badly. This being so, a symbol representing the idea of Scientifiction was urgently needed, and the contest in our April issue was originated for that purpose. We mentioned that the design must be descriptive of the idea of Scientifiction, and we stressed the point that the *important thing was the idea*, and not the design itself. We mentioned that the prize-winning design must be self-explanatory and must be descriptive of Scientifiction.

The contest came to a successful close on May 3rd. Some 965 designs and entries were received, the prize winners being shown on the following pages. It should be noted that the first prize, awarded to Mr. A. A. Kaufman, of 521 East 51st Street, Brooklyn, N. Y., is reproduced exactly as submitted by Mr. Kaufman. It was a crude design at best, but it was the idea and not the artistic effort that counted.

Science is represented by the gear wheel, while the pen represents the fiction part. Here, then, we have Fact and Theory. After we had been satisfied that Mr. Kaufman's idea was the best one, we started to amplify his original idea. In doing so, we borrowed the shape of the design of the second prize winner, Mr. Clarence



PRIZE-WINNING DESIGN

Beck; and from the third prize winner, Mr. A. J. Jacobson, we borrowed two extra wheels, these to mesh with Mr. Kaufman's single wheel.

In substance, Mr. Kaufman's prize-winning design is preserved in the strictest sense, except for a few additions. It was our aim to incorporate as much science as possible in the design, so the frame of the design, representing structural steel, suggests more machinery. The flashes in the central wheel represent Electricity. The top of the fountain pen is a test tube, which stands for Chemistry; while the background with the moon and stars and planet, give us the science of Astronomy.

We believe you will agree with us, that this makes an ideal trade-mark for Scientifiction, and we also admit that we are happy to have had solved for us a difficult problem.

A number of designs which are reproduced in these pages were excellent, but none of them lent themselves as well for trade-mark purposes, as did the one on which we finally settled.

With our announcement in the April issue we said:

"**AMAZING STORIES** will pay \$300.00 in prizes for the best representation of the word 'Scientifiction.' A design—a coat-of-arms—a flag—an emblem, or whatever you may call it, is wanted for 'Scientifiction.'"

*Note particularly the word "emblem." The prize-winning design, therefore, had to be one that could be reduced to a small size, so it could be used as an emblem, such as, for instance, a pin or button. These requirements are fulfilled in the first prize-winning design, and next month we will, through the pages of **AMAZING STORIES**, launch a new activity for Scientifiction fans in which the new emblem will, we hope, play a leading rôle. But more of this next month.*

In the meantime, we congratulate the winners of the prize contest, and to those who did not win a prize, we extend our hearty appreciation for their efforts.

LIST OF PRIZES

FIRST PRIZE\$100.00

A. A. KAUFMAN,
521 East 51st Street, Brooklyn, N. Y.

SECOND PRIZE\$75.00

CLARENCE BECK,
108 Seventh Avenue, West Bend, Wis.

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400 N. 28th Avenue, W., Duluth, Minn.

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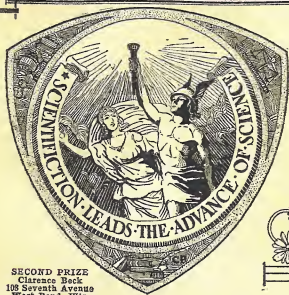
HONORABLE MENTION

ERIC ALDWICKLE,
28 Sault Road,
Toronto, Ontario, Canada.

HONORABLE MENTION

PHILIP SAWYER,
23 Minerva Street, Swampscott, Mass.

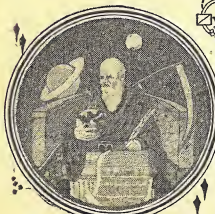
RESULTS OF \$300⁰⁰ PRIZE



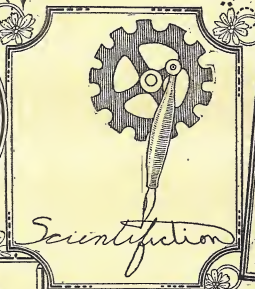
SECOND PRIZE
Clarence Beck
102 Seventh Avenue
West Bend, Wis.



SEVENTH PRIZE
Jack Morcasstein
134 City Avenue, Bronx, N. Y.



FOURTH PRIZE
Carl G. Wilkenhoener
1429 Ardmore Ave., Chicago, Ill.



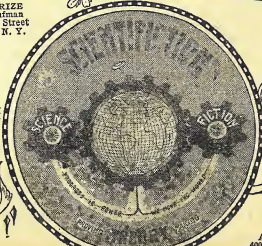
FIRST PRIZE
A. A. Kaufman
511 E. 51st Street
Brooklyn, N. Y.



SIXTH PRIZE
James S. Kilar
44 Dartmouth Street, Springfield, Mass.



FIFTH PRIZE
Albert Schiller
133-46th Street
Brooklyn, N. Y.

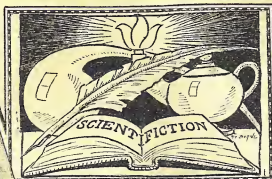


THIRD PRIZE
A. J. Jacobson
400 N. 31st St. W.

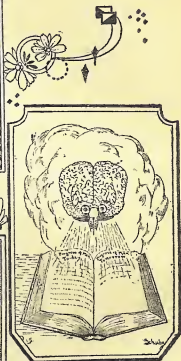
SCIENTIFICTION CONTEST



TENTH PRIZE
Rex Tullson
Grand Haven, Mich.



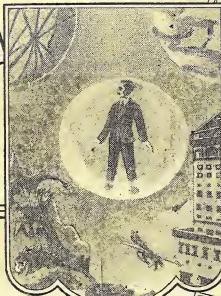
NINTH PRIZE
E. J. Byrne
5 West 134th Street
New York City



HONORABLE MENTION
Parcell G. Schube
3444 Liston Ave., Cincinnati, Ohio



HONORABLE MENTION
Eric Aldwinckle
55 Scarboro Road
Toronto, Ontario
Canada



HONORABLE MENTION
J. S. Taylor
142 Richmond St.
Charlottetown,
P. E. I., Canada



HONORABLE MENTION
Philip Santry



EIGHTH PRIZE
B. Wheelock
N. Warren, Pa.

The GREAT STEEL PANIC

By Irvin Lester and Fletcher Pratt

Author of "The Octopus Cycle"



ALTER WEYL, A.B., A.M., B.Sc., consulting biologist to the New York Police Department, snapped his microscope case shut with a weary sigh. The day, which he had planned to spend in the study of a particularly fascinating group of bryozoans from the Azores, was practically ruined.

"Tell him all right," he said to his laboratory assistant, who was waiting, telephone in hand. "I'll be there in an hour. I suppose somebody thinks he has found a new kind of cootie running around the Tombs without leash or muzzle."

"Why don't you chuck it up?" asked Merrick, the assistant, when he had delivered the message. "You're too big for this minor bug hunting."

"Never can tell," said Weyl, "might be more rats. And Hert's a good fellow and a friend of mine."

He was referring to the incident which had led to his appointment as consulting biologist to a Department which would seem to need anything but biologists; the extraordinary plague of giant rats which had infected the new municipal tenements and which he had curbed in a manner that brought him an international reputation, his appointment and the fast friendship of Deputy Commissioner Hert.

As Weyl left the house he noted a discarded newspaper on the cellar grating. "BROOKLYN BRIDGE WOBBLER" the headline announced, and mildly interested, he stirred it with his toe to glance at what was below. He noted abstractedly that in the place left vacant when the sheet was moved there were two jagged, irregular cuts made through the steel bars, as though they had been sawn by an inexperienced hand, and went on to Hert's office, his mind still on the bryozoans.

"I know what it is," he offered, as he dropped into the leather-covered chair by that dignitary's desk, "You're going to tell me that it isn't exactly in my line, but for goodness' sake, find out whether Mrs. Chandler-Chandler de Poket-broke's pet Pomperanian died of poison or of the blind staggers."

"Only fifty per cent on that one," said the Commissioner with a grin. "It isn't exactly in your line, maybe, but it's a really good one this time—almost as good as the rats. Here's the story:

"You know Brooklyn Bridge is constantly being painted by a crew which goes over it from one year's end to another, every cable and wire rope getting its coat of paint once a year. Well, about three or four

weeks ago one of the painters reported that a small wire cable, way high up, had parted. A new one was fitted, but the next day there were a couple more missing, and this was followed by a regular series of reports of parted wire cables, always small ones.

"The Department of Plants and Structures, which has the bridge in charge, began to get worried, and sent an engineer down to make an examination. He reported that the bridge was good for another three centuries, and that there was no reason in the world for the parting of the cables unless careless painting had admitted some moisture and they had rusted through.

"That was about two weeks ago. Right after his report, the cables began to go in increasing quantities, and when Plants and Structures ordered another examination, they found that in every case the cables had been cut. Then they came to us. There are policemen on duty at each end of the bridge all the time, who should have noted anything unusual, but I put an extra detail on. It looked like the work of a maniac or some superior bit of Bolshevik frightfulness. You remember the bombs in the subway?"

"But the cables kept going in spite of our extra detail. Night before last, I threw a regular cordon of police around each end of the bridge with orders to stop all suspicious persons and placed plain clothes men on all the footpaths. Yesterday morning there were more cables missing and one of those big main supporting cables over a foot in thickness, was nearly cut through in two places—and not one of the police had seen a thing! Moreover the cuts were so far up

that they couldn't have been reached from the bridge floor, without the cutter climbing high up and being sharply outlined against the light we had on the place.

"Naturally, we had to close the bridge to traffic. We haven't been able to accomplish a thing; the papers have got hold of it, and I'll admit, it has me worried."

Weyl gave a low whistle. "Looks as though someone had made himself invisible and were giving a demonstration," he said, "but I fancy it's simpler than that. How about the painters? Have you thought of one of them introducing some sort of slow-acting acid either into his paint or on the cables direct? I'll grant I don't know of any acid that would act that way, but that's no reason there couldn't be one."

"Yes, we thought of the painters, too. The gang only consists of ten men. We have had every one of them under surveillance since Plants and Structures

A BRAND new idea in a scientific story is well told by our new authors. Perhaps you do not believe that certain organisms eat metals or at least bore holes in solid metal. A story was published some years ago in SCIENCE AND INVENTION magazine where certain ants had put a telephone exchange out of business by eating and boring their way through solid lead sheathing surrounding telephone cables, an exceedingly heavy substance, and from the human understanding, quite indigestible. Anyway, we are certain you will enjoy this story, and we state with certainty that it is not half as impossible as it sounds.



... and that the growing terror should lack no element of horror, a large section of the Third Avenue Elevated came crashing to the street, bearing with it a train loaded with passengers.

complained to us, but nothing serious has come of it.

"And that isn't all. I've looked at the ends of the severed cables. They have been cut with a regular hacksaw; no rust, edges sharp and bright. But the funniest part of the whole business turned up this morning just before I called you up. You know they're tearing down the old post office building opposite the City Hall. The masonry is mostly gone from the upper stories and they are getting ready to tackle the steel. Well, this morning Plants and Structures, which has this in charge also, as it's city property, came in with a report that some of the steel beams have been sawed through just like the Brooklyn Bridge cables. It seems like a senseless act of vandalism."

The scientist was silent for a moment, tapping his fingers on the desk. "Tell you what I want you to do," said he, "get me samples of mild bar steel, structural steel, and any other kind of steel you happen to think about and of cast iron and send them over to the laboratory. I'll see if I can find what did it. Send small samples, please."

"Want one of the bridge cables?"

"No-o-o. Wouldn't have room for it in the house."

Weyl reached the street in time to find that the latest sensation, an elevator accident in the Municipal Building in which several people had been killed, was already eclipsing the threatened collapse of the great bridge, and reflected that elevator cables are also made of steel wire, as he made his way to his laboratory.

"**W**HYY do people saw other people's cellar gratings, Merrick?" Weyl asked his assistant as he arranged and ticketed the samples of steel which had been brought in by a policeman.

"To burgle their houses, I suppose," answered the young man.

"But if there is nothing in the house worth burgling? And if the grating is only part cut through? And if nobody could possibly get through even if it were all cut through? And why should anyone want to burgle the Brooklyn Bridge? Hert thinks it's radicals, but Hert sees red flannel bogies under every bush. It's all so like 'Alice in Wonderland,'" murmured the scientist. "Suppose you possess yourself of a hacksaw and get me one of the bars that somebody has been chewing on out in front."

In a few minutes the young man was back. "Look," said Weyl. "Whoever cut this must have been a very inexperienced hand. The edges are irregular. And see these fine starred lines running up the bar. It's almost as though the iron were brittle like glass and someone had smashed it."

"Chemicals?" inquired Merrick.

"I doubt it—but to be on the safe side, you had better take this end of it and analyze for corrosive acids, especially the halogens. You needn't bother about the oxidizing agents. There seems to be no trace of rust. You might try the spectroscope, too. But I have a peculiar idea—"

With this indefinite statement he handed Merrick one end of the broken bar and drawing on a pair of surgical gloves began to treat the other in a manner that would have astonished any metallurgist.

With a fine file, he rasped off a little pile of filings from the sawn end of the bar. A pinch of these was placed on each of the samples sent him by Commissioner Hert, and each sample was placed on a little porcelain dish and put into the temperature regulator where germ cultures were usually grown. A small pinch of the filings remained. This was carefully divided into three parts, and each part mounted on a separate microscope slide. One was treated to a bath in haematoxylin stain, a second to Wright and Semple's stain and a third, left as it was, was slipped into the microphotographing apparatus.

The summer sun went down and the lights were turned on as Weyl worked over his slides, making adjustments here, comparisons with voluminous notebooks and works of reference there, and now and again filing off another tiny sample from a bar of the damaged cellar grating for further examination. Half a dozen microphotographic negatives were drying on the rack, the big X-ray machine was purring softly over another sample and the clock was registering 3:30 when Merrick came in to find his chief with something like a smile of satisfaction on his face.

"What did you get?" asked Weyl.

"No halogens," was the reply. "I got a tiny trace of phosphoric acid on one analysis, but it may have been a mistake. Spectroscope shows strong carbon lines though; seems to be a higher carbon steel than I had supposed. Shall I carry on?"

"In the morning," said Weyl with a yawn. "I think I've got it, but I want confirmatory chemical evidence. You had better make quantitative analyses of samples from the cut end and from the other end of the bar, giving especial attention to the carbon content. Let's go to bed."

They were awakened in the morning by the ringing of the telephone. It was Hert again, anxious and excited.

"I suppose I needn't tell you to use all possible haste in your work," he said. "This thing is getting out of hand. An elevator in the Municipal Building fell yesterday and several people were killed."

"Yes, I saw the paper," said Weyl.

"But the inspector who examined it said that both the ordinary lifting cable and the emergency cable had been cut nearly through with a saw, ready to fall at the first strain. The power cable snapped when the others went. We raided all known radical haunts last night and have every available man working on the case, but we can't prove anything till we know how these devils did it. Have you hit on anything yet?"

"A little," said Weyl. "Forget about the Bolsheviks, Hert. They're not to blame."

"But I got an anonymous letter saying Sacco and Vanzetti were avenged. What makes you think it isn't the radicals? What can we do?"

"Well, you might give the other elevators in the municipal Building a bath in carbolic acid," said Weyl, and hung up while the commissioner was still begging him to be serious.

NEW YORK—and the world—will long remember that day as the beginning of a grim reign

of terror. It was about half-past nine in the morning when Hert called Weyl up, and some millions of New Yorkers, perusing their morning papers were pleased to learn that the anarchistic radicals who had systematically weakened the Brooklyn Bridge and sent people to their deaths in Municipal Building elevators had been caught in the general round-up of hard cases and were now cooling their heels in the Tombs, where they would be confronted with the anonymous letter one of them had written to Deputy Police Commissioner Hert.

But by noon the disquieting tidings that saw-cuts had appeared in cables of the Manhattan Bridge leaked out somehow, and an hour later came the first of those really serious catastrophes that shook the great city in the next week—a terrible subway wreck due to a broken—or cut—rail that had precipitated the speeding train from the tracks and crushed it against the stone walls of its tunnel, with an appalling loss of life.

Nobody thought of connecting the unusual number of auto smashes due to the failure of some essential part (all, like the previous occurrences, in the downtown district) with this, or with the singular accident in which a man was injured when an iron electric light standard suddenly toppled over on him.

Police reserves were mobilized for duty and vacations cancelled as in times of extreme emergency, but even police reserves, it seemed could not prevent the sudden collapse of a surface car on lower Broadway early the next morning, or a second subway wreck that afternoon. And when the towering steel pinnacle of a new thirty-story skyscraper on Nassau Street swayed gently and then came thundering down into the narrow traffic-crowded thoroughfare, carrying with it in its fall a smaller building, and spreading death and destruction, something like a panic began to appear. That evening, too, the *New York World* failed to appear for the first time in its history, and hastily run single sheets carried an explanation that due to serious breakdowns in the great presses, it had been impossible to print the paper.

The next day—the third from the radical round-up and Hert's telephone call to Weyl—the *New York American* joined the *World* in silence. Two more elevator falls were reported, and the whole elevator system of several skyscrapers was declared unsafe upon inspection. Subway trains were running dead slow throughout the city; traffic was paralyzed. The police, driven frantic, were wringing confessions obviously false from the jailed radicals under the impetus of a growing popular clamor for finding the culprits—and that the growing terror should lack no element of horror, a large section of the Third Avenue Elevated came crashing to the street, bearing with it a train loaded with passengers.

Repeated telephone calls from Commissioner Hert had been answered by Merrick with the information that Weyl was "out" until the final one brought the information that "The line has been temporarily disconnected" from Central. The scientist, in truth, had abandoned his laboratory work on the second day, satisfied with the result, and had gone to poke about lower New York examining the wreckage left by the growing list of catastrophes. What he saw seemed to satisfy

him, for he had returned to his office with a more cheerful expression than he had worn for many days and that night an observer would have seen his window lighted till near dawn.

The morning of the fifth day of the reign of terror, counting from the fall of the Municipal Building elevator, brought with it further tidings of disorganization and wreckage. An outside fire escape on a crazy old building in Chinatown had slid to the street, burying half a dozen Orientals in the wreckage. The elevated roads, after a second collapse, had been declared unsafe and had ceased operations. The intelligence of a track-walker had averted another subway wreck by the discovery of a rail neatly cut in two.

But the morning also brought with it some feeling of relief to the harassed Police Commissioner, in the shape of a telephone call from Weyl, asking him to come to the laboratory and bring with him the executives of several leading electrical firms. "Appeal to them," said the scientist. "Tell them they are the only men who can save the situation. I'll explain why and how when you bring them."

COMMISSIONER HERT sat not too comfortably on the edge of a laboratory table, on which were displayed a row of the samples of iron and steel sent to Weyl, together with the compound microscope and a sheaf of microphotographs. Before him stood the biologist, like a showman displaying his wares, and in the five chairs the laboratory afforded were grouped the executives of as many electrical companies.

"You will pardon me," said Weyl, "if I seem long and discursive. I have found the criminal who has made all this trouble, but it is necessary to prove his guilt.

"I will start by reminding you that Commissioner Hert called me into the case in the matter of Brooklyn Bridge. He believed that the cables had been severed by the radicals as an act of terrorism, but wanted me to find out how it was done.

"Now it at once struck me that if a human agency had been at work it was to say the least a very unusual human agency, for the bridge had been brilliantly lighted and under the care of a large number of trained observers when some of the cutting took place. A slow-acting acid either in the paint or applied to the cables, was suggested, but the action of any acid would be revealed by a trace of its salts, and chemical analysis showed no such thing. Besides I had noted that morning that some of my own cellar-gratings had been cut in a similar peculiar fashion, and there was no reason whatever why any radicals should want to waste time on my coal-hole.

"So I had to hunt further afield. As the manifestations of this terror spread, several singular facts began to appear. In every case, the accident was due to the failure of some piece of iron or steel. The accidents were, in the beginning, confined to a comparatively narrow area around Brooklyn Bridge—hand me that map, will you, Merrick? Thank you. On this map of New York I have made a red dot at the scene of each of these steel failures. You see they are clustered thick around Brooklyn Bridge, and thin out gradually

in all directions, except that there seems to be another small center here in Brooklyn.

"In every case the iron or steel that failed had been cut through—not in a clean, straight cut, but in a somewhat jagged fashion, and with lines radiating out from the cut almost as though the metal were brittle and had been shattered by the blow of some blunt and heavy cutting instrument.

"The failures were in all sorts and kinds of iron or steel, causing accidents that ranged from the terrible to the absurd. There were broken subway rails and broken typewriters; half-built skyscrapers collapsing and iron fences, like that around the City Hall, developing cuts. If this were due to any human agency, I argued, it was certainly the work of an insensate maniac.

"But maniacs, proverbially cunning though they are, could hardly have cut the cables on the Brooklyn Bridge while they were under observation or clambered up into elevator shafts to sever wire rope hanging in vacancy, many feet above the bottom of the shaft. This was conclusive to me of the inhuman agency of the phenomena. I hope it will be so to you as well.

"But I had one fact to go on. All the accidents took place in some place where the iron or steel was exposed to the air.

"Then I got a piece of the steel from my cellar grating and set to work on it. The chemical analysis showed only a rather higher percentage of carbon than usual, for which there was no adequate explanation. But the microscope gave me something. There are always a certain number of bacteria—germs—floating around in the air and resting on things. Filings from the cut place on the grating bar showed the normal bacteria, but also a large, a perfectly extraordinary number of a hitherto uncatalogued type of bacteria, ladder-like in form and perfectly amazing in activity. If you will examine these microphotographs you will see some of them." He passed around the pictures amid an interested silence on the part of the electrical men and a fidgety silence on the part of Commissioner Hert.

"Could this cutting of steel, then, be due to bacterial action, I asked myself?" continued Weyl. "Every other fact fitted in with it. Bacteria could work without being seen on Brooklyn Bridge; bacteria could get into elevator shafts, bacteria would not care whether it was a typewriter or a skyscraper they were wrecking.

"It is perfectly true that iron and steel seem to be unusually hard and difficult objects for bacterial action, but then I began to remember the geological history of iron.

"As you know, bacterial activity has occurred in ore deposits in many parts of the earth. But how did bacteria get into these deposits? According to geologists, working in the light of modern biological science, the ore deposits are the work of algae and iron bacteria. In other words, there were, far back in geologic ages, bacteria—germs—which secreted and deposited iron oxide, just as the bacteria of disease secrete and deposit poisons.

"They lived on iron, in fact. Now this may appear peculiar, but it is not at all incredible when one considers that there are many animals in nature, which

make short work of much harder substances. The whelk, to mention one, lives on oysters, which it extracts from boring through the extremely hard shell surrounding the bivalve. Some worms bore rock, and—well, I could multiply instances, but it would be unnecessary.

"So for the time, I accepted the hypothesis that the steel was attacked by bacteria of this new type; in other words, was diseased, was sick. I set myself to prove it by experiment. From the diseased end of my cellar grating I took some filings and placed them on each of these samples of steel sent me by Commissioner Hert.

"That was five days ago. Look at them now." He pointed to the little blocks of steel, each on its porcelain dish. Each had melted as a lump of sugar melts when touched by water, some from the center, some from the edges, till hardly anything of them was left.

"If your policemen hadn't been so busy hunting for radicals, Hert," the scientist went on, "they would have noticed that after every break the broken steel kept on melting away from the point where the break occurred.

"Well, I had my criminal, or rather my disease. The next thing was to prescribe a remedy. Carbolic acid kills these bacteria as it does many others—I was perfectly serious when I told you to give the Municipal Building elevators a bath in it, Hert—but of course, it would be almost impossible to apply carbolic acid to all the infected places in the city. Moreover, while we were doing it, new centers would develop.

"These bacteria multiply very rapidly and spread with phenomenal speed.

"Their action consists in uniting the iron with carbon dioxide and some material they secrete, forming a compound that is very soluble, and hence leaves the edge of the diseased steel with a bright appearance as the compound dissolves in a little moisture. Therefore the iron or steel they work on must have free access to the air (which contains a certain amount of carbon dioxide) for them to exist. I fancy that is the reason why we have not heard of any steel giving way, except where it is exposed. It would be terrible indeed, if all the steel in New York's skyscrapers were open to their attacks.

"During the past few days I have been working along the line of excluding the steel from air. No really satisfactory way presented itself. To give only one instance, the subway rails could not well be covered by any kind of protective coating.

"Then I observed something else. In the subway and elevated breakages, it was always the running rails and not the power rails that were attacked; in the elevator failures the supporting cables but not the power cables gave way; telephone cables were undamaged. It occurred to me that these bacteria found steel which was near to an electric current decidedly unhealthy.

"So I experimented again, first with high voltage and gradually with reduced voltage, and I found that not only do the bacteria not attack steel near to which an electric current is passing, but that even the mildest electrical shock is fatal to them. If you will come to the microscope—"

He attached a small dry cell to one of the dissolving

steel samples with copper wire and placed it in the object piece of the big microscope, with a small switch breaking the circuit. "Now Hert—" said Weyl, and the police commissioner, looking through the glass, saw the metal swarming with a monstrous growth of ladder-like shapes that swam slowly.

"Now I'm going to close the switch," said the scientist, and instantly the moving shapes were still.

In silence the electrical men followed him to the glass and saw the miracle repeated.

"Now I do not profess to know how these bacteria developed or how they got here. That is a subject for future investigation," said Weyl. "But I do know

that civilization is faced with a terrible danger, and that you electrical men are the only ones who can save us. A current, no matter how weak, must be passed through every piece of exposed iron or steel in the city! It's up to you."

It was Howells of the New York Light & Power, who was first on his feet, with the words that marked the beginning of the end of the terrible steel sickness and the accidents it had brought about. "Mr. Weyl and Commissioner Hert," he said, "our resources are at your disposal. One of the pleasures of being head of a large corporation is that one can take part in large movements."

THE END

A New Scientifiction Story



The Vanguard of Venus

by Landell Bartlett

This story will not be published in any magazine but we have arranged to give it to our readers in attractive book form—ABSOLUTELY FREE. Turn to page 459 and learn all about this big Free offer. Remember! This is the only way that you will ever be able to read this remarkable tale.



The SKYLARK of SPACE

By Edward Elmer Smith

In Collaboration with Lee Hawkins Garby

What Went Before:

DURING an experiment for the Government Bureau of Chemistry, in which Richard Seaton, a clever chemist, had been electrolyzing his solution of "X," the unknown metal, he accidentally discovered the enormous power of this solution when acted on by the electric current. When the steam-bath, upon which he had been experimenting, suddenly flies out of its place, through the air, and beyond the range of a powerful telescope, he realizes that he has discovered the means for liberating intra-atomic energy. Luckily for him, the energy was given off slowly that time.

A demonstration in the government laboratories the following day proved unsuccessful on account of a flaw in the electrical connection, so Seaton leaves the government employ and takes his solution with him for some personal experiments.

Mr. Reynolds Crane, a millionaire friend of Seaton, becomes interested, and they decide, together, to build first a space-flier, to be propelled by this intra-atomic energy, and later a power plant to supply the world with all its necessary power.

Mr. Marc DuQuene, a fellow chemist in the government employ, is certain that the unsuccessful demonstration was "faked" when he learns that Crane is helping Seaton. He goes to Brookings, head of the Steel Trust, and offers to help them get the solution and utilize it. He had nefarious dealings with them before. He asks an enormous sum in return. Brookings refuses DuQuene his offer and gets some of the solution of "X." Their own chemist is sent to a lonely spot to experiment with a few drops of the solution, and very shortly after that the world hears of a mysterious explosion that takes with it the chemist and a considerable amount of the surrounding ground and property.

When Seaton and Crane learn of the explosion, they conclude that someone, somehow, has gotten hold of "X," and a test of the contents of their vial which contained it, proves that

some of this solution was taken out of it. They are later led to suspect DuQuene, because he is the only chemist who would know anything about the solution, and who would dare to experiment with it, but they cannot "get" him. Following DuQuene with a special compass which Seaton had invented, they know that somehow Steel is connected with him. They can do nothing but become extra cautious and wary. Steel, who is now willing to give DuQuene anything he wants, and DuQuene, have made several attempts at stealing the solution, but so far have been able to get nothing but some plans and a small vial of diluted solution.

Steel, in building the ship for Crane, uses faulty material, which they hope will not be noticed, until the ship is out in interstellar space. However, Seaton and Crane discover the faulty material and are secretly having another ship built, much larger and better equipped, unknown to Steel.

During a consultation with Perkins, a super-criminal detective, they decide that they might make Crane or Seaton "talk" if they kidnap Dorothy Vaneman, daughter of a prominent lawyer, and Seaton's sweetheart.

Margaret Spencer, Brookings' secretary, has obtained some damaging evidence against Steel, particularly in relation to some inventions originated by her father which that company swindled him out of. To make her surrender that evidence, they decide to abduct her also, when they take Dorothy Vaneman to another planet for awhile.

Just before Seaton and Crane are ready for their initial big flight, Seaton hands Mr. Vaneman a sealed envelope containing instructions, in reference to the solution and its practical use, now in invisible sympathetic ink, between the lines of a typed manuscript. This is to be used in the event that both Seaton and Crane are killed.

Part II

CHAPTER VIII Indirect Action

THE afternoon following the homecoming of the Skylark, Seaton and Dorothy returned from a long horseback ride in the park. After Seaton had mounted his motorcycle Dorothy turned toward a bench in the shade of an old elm to watch a game of tennis on the court next door. Scarcely had she seated herself when a great copper-plated ball alighted upon the lawn in front of her. A heavy steel door snapped open and a powerful figure clad in aviator's leather, the face completely covered by the hood, leaped out. She jumped to her feet with a cry of joyful surprise, thinking it was Seaton—a cry which died suddenly as she realized that Seaton had just left her and that this vessel was

far too small to be the Skylark. She turned in flight, but the stranger caught her in three strides. She found herself helpless in a pair of arms equal in strength to Seaton's own. Picking her up lightly as a baby, DuQuene carried her over to the space-car. Shriek after shriek rang out as she found that her utmost struggles were of no avail against the giant strength of her captor, that her fiercely-driven nails glanced harmlessly off the heavy glass and leather of his hood, and that her teeth were equally ineffective against his suit.

With the girl in his arms DuQuene stepped into the vessel, and as the door clanged shut behind them Dorothy caught a glimpse of another woman, tied hand and foot in one of the side seats of the car.

"Tie her feet, Perkins," DuQuene ordered brusquely, holding her around the body so that her feet extended straight out in front of him. "She's a wildcat."

THE author of this story, being a chemist of high standing and an excellent mathematician, gives us a rare gem in this interplanetary tale. For one thing, he suggests an interesting use of the action of acceleration. In this installment it is made to take the place of gravity when the interplanetary vehicle is out in open space. In order to get the gravity effect, a positive or negative acceleration could be given out.

This installment retains its easy flow of language and continues to develop surprise episodes with a remarkable degree of realism.



The great tree standing on the farther edge of the island suddenly bent over, lashing out like a snake and grasping both. It transfixed them with the terrible thorns, which were now seen to be armed with needlepoints and to possess barbs like fish-hooks.

As Perkins threw one end of a small rope around her ankles Dorothy doubled up her knees, drawing her feet as far away from him as possible. As he incautiously approached, she kicked out viciously, with all the force of her muscular young body behind her heavy riding-boots.

The sharp heel of one small boot struck Perkins squarely in the pit of the stomach—a true "solar-plexus" blow—and completely knocked out, he staggered back against the instrument-board. His out-flung arm pushed the speed lever clear out to its last notch, throwing the entire current of the batteries through the bar, which was pointed straight up, as it had been when they made their landing, and closing the switch which threw on the power of the repelling outer coating. There was a creak of the mighty steel fabric, stressed almost to its limit as the vessel darted upward with its stupendous velocity, and only the carefully-planned spring-and-cushion floor saved their lives as they were thrown flat and held there by the awful force of their acceleration as the space-car tore through the thin layer of the earth's atmosphere. So terrific was their speed, that the friction of the air did not have time to set them afire—they were through it and into the perfect vacuum of interstellar space before the thick steel hull was even warmed through. Dorothy lay flat upon her back, just as she had fallen, unable even to move her arms, gaining each breath only by a terrible effort. Perkins was a huddled heap under the instrument-board. The other captive, Brookings' ex-secretary, was in somewhat better case, as her bonds had snapped like string and she was lying at full length in one of the side-seats—forced into that position and held there, as the design of the seats was adapted for the most comfortable position possible under such conditions. She, like Dorothy, was gasping for breath, her straining muscles barely able to force air into her lungs because of the paralyzing weight of her chest.

DuQuesne alone was able to move, and it required all of his Herculean strength to creep and crawl, snake-like, toward the instrument-board. Finally attaining his goal, he summoned all his strength to grasp, not the controlling lever, which he knew was beyond his reach, but a cut-out switch only a couple of feet above his head. With a series of convulsive movements he fought his way up, first until he was crouching on his elbows and knees, and then into a squatting position. Placing his left hand under his right, he made a last supreme effort. Perspiration streamed from him, his mighty muscles stood out in ridges visible even under the heavy leather of his coat, his lips parted in a snarl over his locked teeth as he threw every ounce of his wonderful body into an effort to force his right hand up to the switch. His hand approached it slowly—closed over it and pulled it out.

The result was startling. With the mighty power instantly cut off, and with not even the ordinary force of gravitation to counteract the force DuQuesne was exerting, his own muscular effort hurled him up toward the center of the car and against the instrument-board. The switch, still in his grasp, was again closed. His shoulder crashed against the levers which controlled the direction of the bar, swinging it through a wide arc.

As the ship darted off in the new direction with all its old acceleration, he was hurled against the instrument-board, tearing one end loose from its supports and falling unconscious to the floor on the other side. After a time, which seemed like an eternity, Dorothy and the other girl felt their senses slowly leave them.

With four unconscious passengers, the space-car hurtled through empty space, its already inconceivable velocity being augmented every second by a quantity bringing its velocity near to that of light, driven onward by the incredible power of the disintegrating copper bar.

SEATON had gone only a short distance from his sweetheart's home when over the purring of his engine he thought he heard Dorothy's voice raised in a scream. He did not wait to make sure, but whirled his machine about and the purring changed instantly to a staccato roar as he threw open the throttle and advanced the spark. Gravel flew from beneath his skidding wheels as he negotiated the turn into the Vaneman grounds at suicidal speed. But with all his haste he arrived upon the scene just in time to see the door of the space-car close. Before he could reach it the vessel disappeared, with nothing to mark its departure save a violent whirl of grass and sod, uprooted and carried far into the air by the vacuum of its wake. To the excited tennis-players and the screaming mother of the abducted girl it seemed as though the great metal ball had vanished utterly—only Seaton, knowing what to expect, saw the line it made in the air and saw for an instant a minute dot in the sky before it disappeared.

Interrupting the clamor of the young people, each of whom was trying to tell him what had happened, he spoke to Mrs. Vaneman.

"Mother, Dottie's all right," he said rapidly but gently. "Steel's got her, but they won't keep her long. Don't worry, we'll get her. It may take a week or it may take a year, but we'll bring her back," and leaping upon his motorcycle, he shattered all the speed laws on his way to Crane's house.

"Mart!" he yelled, rushing into the shop, "they've got Dottie, in a bus made from our plans. Let's go!" as he started on a run for the testing shed.

"Wait a minute!" crisply shouted Crane. "Don't go off half-cocked. What is your plan?"

"Plan, hell!" barked the enraged chemist. "Chase 'em!"

"Which way did they go, and when?"

"Straight up, full power, twenty minutes ago."

"Too long ago. Straight up has changed its direction several degrees since then. They may have covered a million miles, or they may have come back and landed next door. Sit down and think—we need all your brains now."

Regaining his self-possession as the wisdom of his friend's advice came home to him, Seaton sat down and pulled out his pipe. There was a tense silence for an instant. Then he leaped to his feet and darted into his room, returning with an object-compass whose needle pointed upward.

"DuQuesne did it," he cried exultantly. "This baby is still looking right at him. Now let's go—make it snappy!"

"Not yet. We should find out how far away they are; that may give us an idea."

Suiting action to word, he took up his stopwatch and set the needle swinging. They watched it with strained faces as second after second went by and it still continued to swing. When it had come to rest Crane read his watch and made a rapid calculation.

About three hundred and fifty million miles," he stated. "Clear out of our solar system already, and from the distance covered he must have had a constant acceleration so as to approximate the velocity of light, and he is still going with full . . ."

"But nothing can possibly go that fast, Mart, it's impossible. How about Einstein's theory?"

"That is a theory, this measurement of distance is a fact, as you know from our tests."

"That's right. Another good theory gone to pot. But how do you account for his distance? D'you suppose he's lost control?"

"He must have. I do not believe that he would willingly stand that acceleration, nor that he would have gone that far of his own accord. Do you?"

"I sure don't. We don't know how big a bar they are carrying, so we can't estimate how long it is going to take us to catch them. But let's not waste any more time, Mart. For Cat's sake, let's get busy!"

"We have only those four bars, Dick—two for each unit. Do you think that will be enough? Think of how far we may have to go, what we may possibly get into, and what it will mean to Dottie if we fail for lack of power."

Seaton, though furiously eager to be off, paused at this new idea, and half-regretfully he replied:

"We are so far behind them already that I guess a few hours more won't make much difference. It sure would be disastrous to get out near one of the fixed stars and have our power quit. I guess you're right, we'd better get a couple more—make it four, then we'll have enough to chase them half our lives. We'd better load up on grub and X-plosive ammunition, too."

WHILE Crane and Shiro carried additional provisions and boxes of cartridges into the "Skylark," Seaton once more mounted his motorcycle and sped across the city to the brass foundry. The manager of the plant took his order, but blandly informed him that there was not that much copper in the city, that it would be a week or ten days before the order could be filled. Seaton suggested that they melt up some copper cable and other goods already manufactured, offering ten times their value, but the manager was obdurate, saying that he could not violate the rule of priority of orders. Seaton then went to other places, endeavoring to buy scrap copper, trolley wire, electric cable, anything made of the ruddy metal, but found none for sale in quantities large enough to be of any use. After several hours of fruitless search, he returned home in a towering rage and explained to Crane, in lurid language, his failure to secure the copper. The latter was unmoved.

"After you left, it occurred to me that you might not get any. You see, Steel is still watching us."

Fire shot from Seaton's eyes.

"I'm going to clean up that bunch," he gritted

through his teeth as he started straight for the door.

"Not yet, Dick," Crane remonstrated. "We can go down to Wilson's in a few minutes, and I know we can get it there if he has it. The "Skylark" is all ready to travel."

No more words were needed. They hurried into the space-car and soon were standing in the office of the plant in which the vessel had been built. When they had made their wants known, the iron-master shook his head.

"I'm sorry, Crane, but I have only a few pounds of copper in the shop, and we have no suitable furnace."

Seaton broke out violently at this, but Crane interrupted him, explaining their inability to get the metal anywhere else and the urgency of their need. When he had finished, Wilson brought his fist down upon his desk.

"I'll get it if I have to melt up our dynamos," he roared. "We'll have to rig a crucible, but we'll have your bars out just as soon as the whole force of this damned scrap-heap can make 'em!"

Calling in his foreman, he bellowed orders, and while automobiles scoured the nearby towns for scrap copper, the crucible and molds were made ready.

Nearly two days passed before the gleaming copper cylinders were finished. During this time Crane added to their already complete equipment every article he could conceive of their having any use for, while Seaton raged up and down the plant in a black fury of impatience. Just before the bars were ready, they made another reading on the object-compass. Their faces grew tense and drawn and their hearts turned sick as second followed second and minute followed minute and the needle still oscillated. Finally, however, it came to rest, and Seaton's voice almost failed him as he read his figures.

"Two hundred and thirty-five light-years, Mart. They're lost, and still going. Good-bye, old scout," holding out his hand, "Tell Vaneman that I'll bring her back or else stay out there myself."

"You must be crazy, Dick. You know I am going."

"Why? No use in both of us taking such a chance. If Dottie's gone, of course I want to go too, but you don't."

"Nonsense, Dick. Of course this is somewhat farther than we had planned on going for our maiden voyage, but where is the difference? It is just as safe to go a thousand light-years as only one, and we have power and food for any contingency. There is no more danger in this trip than there is in one to Mars. At all events, I am going whether you want me to or not, so save your breath."

"You lie like a thief, Mart—you know what we are up against as well as I do. But if you insist on coming along, I'm sure glad to have you."

As their hands met in a crushing grip, the bars were brought up and loaded into the carriers. Waving good-bye to Wilson, they closed the massive door and took their positions. Seaton adjusted the bar parallel with the needle of the object-compass, turned on the coil, and advanced the speed-lever until Crane, reading the pyrometers, warned him to slow down, as the shell was heating. Free of the earth's atmosphere, he slowly

advanced the lever, one notch at a time, until he could no longer support the increasing weight of his hand, but had to draw out the rolling support designed for that emergency. He pushed the lever a few notches farther, and felt himself forced down violently into the seat. He was now lying at full length, the seat having automatically moved upward so that his hand still controlled the lever. Still he kept putting on more power, until the indicator showed that more than three-quarters of the power was in operation and he felt that he could stand but little more.

"How are you making it, Mart?" he asked, talking with difficulty because of the great weight of his tongue and jaws.

"All right so far," came the response, in a hesitating, almost stammering voice, "but I do not know how much more I can take. If you can stand it, go ahead."

"This is enough for awhile, until we get used to it. Any time you want to rest, tell me and I'll cut her down."

"Keep her at this for four or five hours. Then cut down until we can walk, so that we can eat and take another reading on distance. Remember that it will take as long to stop as it does to get-up speed, and that we must be careful not to ram them. There would be nothing left of either car."

"All right. Talking's too darn much work, I'll talk to you again when we ease down. I sure am glad we're on our way at last."

CHAPTER IX Lost In Space

FOR forty-eight hours the uncontrolled atomic motor dragged the masterless vessel with its four unconscious passengers through the illimitable reaches of empty space, with an awful and constantly increasing velocity. When only a few traces of copper remained in the power-plant, the acceleration began to decrease and the powerful springs began to restore the floor and the seats to their normal positions. The last particle of copper having been transformed into energy, the speed of the vessel became constant. Apparently motionless to those inside it, it was in reality traversing space with a velocity thousands of times greater than that of light. As the force which had been holding them down was relaxed, the lungs, which had been able to secure only air enough to maintain faint sparks of life, began to function more normally and soon all four recovered consciousness, drinking in the life-giving oxygen in a rapid succession of breaths so deep that it seemed as though their lungs must burst with each inhalation.

DuQuesne was the first to gain control of himself. His first effort to rise to his feet lifted him from the floor, and he floated lightly to the ceiling, striking it with a gentle bump and remaining suspended in the air. The others, who had not yet attempted to move, stared at him in wide-eyed amazement. Reaching out and clutching one of the supporting columns, he drew himself back to the floor and cautiously removed his leather suit, transferring two heavy automatic pistols as he did so. By gingerly feeling of his injured body,

he discovered that no bones were broken, although he was terribly bruised. He then glanced around to learn how his companions were faring. He saw that they were all sitting up, the girls resting, Perkins removing his aviator's costume.

"Good morning, Doctor DuQuesne. What happened when I kicked your friend?"

DuQuesne smiled.

"Good morning, Miss Vaneman. Several things happened. He fell into the controls, turning on all the juice. We left shortly afterward. I tried to shut the power off, and in doing so I balled things up worse than ever. Then I went to sleep, and just woke up."

"Have you any idea where we are?"

"No, but I can make a fair estimate, I think," and glancing at the empty chamber in which the bar had been, he took out his notebook and pen and figured for a few minutes. As he finished, he drew himself along by a handrail to one of the windows, then to another. He returned with a puzzled expression on his face and made a long calculation.

"I don't know exactly what to make of this," he said thoughtfully. "We are so far away from the earth that even the fixed stars are unrecognizable. The power was on exactly forty-eight hours, since that is the life of that particular bar under full current. We should still be close to our own solar system, since it is theoretically impossible to develop any velocity greater than that of light. But in fact, we have. I know enough about astronomy to recognize the fixed stars from any point within a light-year or so of the sun, and I can't see a single familiar star. I never could see how mass could be a function of velocity, and now I am convinced that it is not. We have been accelerating for forty-eight hours!"

He turned to Dorothy.

"While we were unconscious, Miss Vaneman, we had probably attained a velocity of something like seven billion four hundred thirteen million miles per second, and that is the approximate speed at which we are now traveling. We must be nearly six quadrillion miles, and that is a space of several hundred light-years—away from our solar system, or, more plainly, about six times as far away from our earth as the North Star is. We couldn't see our sun with a telescope, even if we knew which way to look for it."

AT this paralyzing news, Dorothy's face turned white and Margaret Spencer quietly fainted in her seat.

"Then we can never get back?" asked Dorothy slowly.

At this question, Perkins' self-control gave way and his thin veneer of decency disappeared completely.

"You got us into this whole thing!" he screamed as he leaped at Dorothy with murderous fury gleaming in his pale eyes and his fingers curved into talons. Instead of reaching her, however, he merely sprawled grotesquely in midair, and DuQuesne knocked him clear across the vessel with one powerful blow of his fist.

"Get back there, you cowardly cur," he said evenly.

"Even though we are a long way from home, try to remember you're a man, at least. One more break like that and I'll throw you out of the boat. It isn't her

fault that we are out here, but our own. The blame for it is a very small matter, anyway; the thing of importance is to get back as soon as possible."

"But how can we get back?" asked Perkins sullenly from the corner where he was crouching, fear in every feature. "The power is gone, the controls are wrecked, and we are hopelessly lost in space."

"Oh, I wouldn't say 'hopelessly,'" returned the other, "I have never been in any situation yet that I couldn't get out of, and I won't be convinced until I am dead that I can't get out of this one. We have two extra power bars, we can fix the board, and if I can't navigate us back close enough to our solar system to find it, I am more of a dub than I think I am. How about a little bite to eat?"

"Show us where it is!" exclaimed Dorothy. "Now that you mention it, I find that I am starved to death."

DuQuesne looked at her keenly.

"I admire your nerve, Miss Vaneman. I didn't suppose that that animal over there would show such a wide streak of yellow, but I was rather afraid that you girls might go to pieces."

"I'm scared blue, of course," Dorothy admitted frankly, "but hysterics won't do any good, and we simply must get back."

"Certainly, we must and we will," stated DuQuesne calmly. "If you like, you might find something for us to eat in the galley there, while I see what I can do with this board that I wrecked with my head. By the way, that cubby-hole there is the apartment reserved for you two ladies. We are in rather cramped quarters, but I think you will find everything you need."

As Dorothy drew herself along the handrail toward the room designated, accompanied by the other girl who, though conscious, had paid little attention to anything around her, she could not help feeling a thrill of admiration for the splendid villain who had abducted her. Calm and cool, always master of himself, apparently paying no attention to the terrible bruises which disfigured half his face and doubtless half his body as well, she admitted to herself that it was only his example, which had enabled her to maintain her self-control in their present plight. As she crawled over Perkins' discarded suit, she remembered that he had not taken any weapons from it. After a rapid glance around to assure herself that she was not being watched, she quickly searched the coat, bringing to light not one, but two pistols, which she thrust into her pocket. She saw with relief that they were regulation army automatics, with whose use she was familiar from much target practise with Seaton.

In the room, which was a miniature of the one she had seen on the Skylark, the girls found clothing, toilet articles, and everything necessary for a long trip. As they were setting themselves to rights, Dorothy electing to stay in her riding suit, they surveyed each other frankly and each was reassured by what she saw. Dorothy saw a girl of twenty-two, of her own stature, with a mass of heavy, wavy black hair. Her eyes, a singularly rich and deep brown, contrasted strangely with the beautiful ivory of her skin. She was normally a beautiful girl, thought Dorothy, but her beauty was marred by suffering and privation. Her naturally

slender form was thin, her face was haggard and worn. The stranger broke the silence.

"M Margaret Spencer," she began abruptly, "former secretary to His Royal Highness, Brookings of Steel. They swindled my father out of an invention worth millions and he died, broken-hearted. I got the job to see if I couldn't get enough evidence to convict them, and I had quite a lot when they caught me. I had some things that they were afraid to lose, and I had them so well hidden that they couldn't find them, so they kidnapped me to make me give them back. They haven't dared kill me so far for fear the evidence will show up after my death—which it will. However, I will be legally dead before long, and then they know the whole thing will come out, so they have brought me out here to make me talk or kill me. Talking won't do me any good now, though, and I don't believe it ever would have. They would have killed me after they got the stuff back, anyway. So you see I, at least, will never get back to the earth alive."

"Cheer up—we'll all get back safely."

"No, we won't. You don't know that man Perkins—if that is his name. I never heard him called any real name before. He is simply unspeakable—vile—hideous—everything that is base. He was my jailer, and I utterly loathe and despise him. He is mean and underhanded and tricky—he reminds me of a slinky, poisonous snake. He will kill me: I know it."

"But how about Doctor DuQuesne? Surely he isn't that kind of man? He wouldn't let him."

"I've never met him before, but from what I heard of him in the office, he's even worse than Perkins, but in an entirely different way. There's nothing small or mean about him, and I don't believe he would go out of his way to hurt anyone, as Perkins would. But he is absolutely cold and hard, a perfect fiend. Where his interests are concerned, there's nothing under the sun, good or bad, that he won't do. But I'm glad that Perkins had me instead of 'The Doctor,' as they call him. Perkins raises such a bitter personal feeling, that anybody would rather die than give up to him in anything. DuQuesne, however, would have tortured me impersonally and scientifically—cold and self-contained all the while and using the most efficient methods, and I am sure he would have got it out of me some way. He always gets what he goes after."

"Oh, come, Miss Spencer!" Dorothy interrupted the half-hysterical girl. "You're too hard on him. Didn't you see him knock Perkins down when he came after me?"

"Well, maybe he has a few gentlemanly instincts, which he uses when he doesn't lose anything by it. More likely he merely intended to rebuke him for a useless action. He is a firm Pragmatist—anything that is useful is all right, anything that is useless is a crime. More probably yet, he wants you left alive. Of course that is his real reason. He went to the trouble of kidnapping you, so naturally he won't let Perkins or anybody else kill you until he is through with you. Otherwise he would have let Perkins do anything he wanted to with you, without lifting a finger."

"I can't quite believe that," Dorothy replied, though

a cold chill struck at her heart as she remembered the inhuman crime attributed to this man, and she quailed at the thought of being in his charge, countless millions of miles from earth, a thought only partly counteracted by the fact that she was now armed. "He has treated us with every consideration so far, let's hope for the best. Anyway, I'm sure that we'll get back safely."

"Why so sure? Have you something up your sleeve?"

"No—or yes, in a way I have, though nothing very definite. I'm Dorothy Vaneman, and I am engaged to the man who discovered the thing that makes this space-car go. . . ."

"That's why they kidnapped you, then—to make him give up all his rights to it. It's like them."

"Yes, I think that's why they did it. But they won't keep me long. Dick Seaton will find me, I know. I feel it."

"But that's exactly what they want!" cried Margaret excitedly. "In my spying around I heard a little about this very thing—the name Seaton brings it to my mind. His car is broken in some way, so that it will kill him the first time he tries to run it."

"That's where they underestimated Dick and his partner. You have heard of Martin Crane, of course?"

"I think I heard his name mentioned in the office, together with Seaton's, but that's all."

"Well, besides other things, Martin is quite a wonderful mechanic, and he found out that our Skylark was spoiled. So they built another one, a lot bigger, and I am sure that they are following us, right now."

"But how can they possibly follow us, when we are going so fast and are so far away?" queried the other girl, once more despondent.

"I don't quite know, but I do know that Dick will find a way. He's simply wonderful. He knows more now than that Doctor DuQuesne will ever learn in all his life, and he will find us in a few days, I feel it in my bones. Besides, I picked Perkins' pockets of these two pistols. Can you shoot an automatic?"

"Yes," replied the other girl, as she seized one of the guns, assured herself that its magazine was full, and slipped it into her pocket. "I used to practise a lot with my father's. This makes me feel a whole lot better. And call me Peggy, won't you? It will seem good to hear my name again. After what I've been through lately, even this trip will be a vacation for me."

"Well, then, cheer up, Peggy dear, we're going to be great friends. Let's go get us all something to eat. I'm simply starved, and I know you are, too."

THE presence of the pistol in her pocket and Dorothy's unwavering faith in her lover, lifted the stranger out of the mood of despair into which the long imprisonment, the brutal treatment, and the present situation had plunged her, and she was almost cheerful as they drew themselves along the hand-rail leading to the tiny galley.

"I simply can't get used to the idea of nothing having any weight—look here!" laughed Dorothy, as she took a boiled ham out of the refrigerator and hung it upon an imaginary hook in the air, where it remained motionless. "Doesn't it make you feel funny?"

"It is a queer sensation. I feel light, like a toy bal-

loon, and I feel awfully weird inside. If we have no weight, why does it hurt so when we bump into anything? And when you throw anything, like the Doctor did Perkins, why does it hit as hard as ever?"

"It's mass or inertia or something like that. A thing has it everywhere, whether it weighs anything or not. Dick explained it all to me. I understood it when he told me about it, but I'm afraid it didn't sink in very deep. Did you ever study physics?"

"I had a year of it in college, but it was more or less of a joke. I went to a girls' school, and all we had to do in physics was to get the credit; we didn't have to learn it."

"Me too. Next time I go to school I'm going to Yale or Harvard or some such place, and I'll learn so much mathematics and science that I'll have to wear a bandeau to keep my massive intellect in place."

During this conversation they had prepared a substantial luncheon and had arranged it daintily upon two large trays, in spite of the difficulty caused by the fact that nothing would remain in place by its own weight. The feast prepared, Dorothy took her tray from the table as carefully as she could, and saw the sandwiches and bottles start to float toward the ceiling. Hastily inverting the tray above the escaping viands, she pushed them back down upon the table. In doing so she lifted herself clear from the floor, as she had forgotten to hold herself down.

"What'll we do, anyway?" she wailed when she had recovered her position. "Everything wants to fly all over the place!"

"Put another tray on top of it and hold them together," suggested Margaret. "I wish we had a bird-cage. Then we could open the door and grab a sandwich as it flies out."

By covering the trays the girls finally carried the luncheon out into the main compartment, where they gave DuQuesne and Perkins one of the trays and all fell to eating hungrily. DuQuesne paused with a glint of amusement in his one sound eye as he saw Dorothy trying to pour gingerale out of a bottle.

"It can't be done, Miss Vaneman. You'll have to drink it through a straw. That will work, since our air pressure is normal. Be careful not to choke on it, though; your swallowing will have to be all muscular out here. Gravity won't help you. Or wait a bit—I have the control board fixed and it will be a matter of only a few minutes to put in another bar and get enough acceleration to take the place of gravity."

He placed one of the extra power bars in the chamber and pushed the speed lever into the first notch, and there was a lurch of the whole vessel as it swung around the bar so that the floor was once more perpendicular to it. He took a couple of steps, returned, and advanced the lever another notch.

"There that's about the same as gravity. Now we can act like human beings and eat in comfort."

"That's a wonderful relief, Doctor!" cried Dorothy.

"Are we going back toward the earth?"

"Not yet. I reversed the bar, but we will have to use up all of this one before we can even start back. Until this bar is gone we will merely be slowing down."

AS the meal progressed, Dorothy noticed that DuQuesne's left arm seemed almost helpless, and that he ate with great difficulty because of his terribly bruised face. As soon as they had removed the trays she went into her room, where she had seen a small medicine chest, and brought out a couple of bottles.

"Lie down here, Doctor DuQuesne," she commanded. "I'm going to apply a little first-aid to the injured. Arnica and iodine are all I can find, but they'll help a little."

"I'm all right," began the scientist, but at her imperious gesture he submitted, and she lathed his battered features with the healing lotion and painted the worst bruises with iodine.

"I see your arm is lame. Where does it hurt?"

"Shoulder's the worst. I rammed it through the board when we started out."

He opened his shirt at the throat and bared his shoulder, and Dorothy gasped—as much at the size and power of the muscles displayed, as at the extent and severity of the man's injuries. Stepping into the gallery, she brought out hot water and towels and gently bathed away the clotted blood that had been forced through the skin.

"Massage it a little with the arnica as I move the arm," he directed coolly, and she did so, pityingly. He did not wince and made no sign of pain, but she saw beads of perspiration appear upon his face, and wondered at his fortitude.

"That's fine," he said gratefully as she finished, and a peculiar expression came over his face. "It feels one hundred per cent better already. But why do you do it? I should think you would feel like crowning me with that basin instead of playing nurse."

"Efficiency," she replied with a smile. "I'm taking a leaf out of your own book. You are our chief engineer, you know, and it won't do to have you laid up."

"That's a logical explanation, but it doesn't go far enough," he rejoined, still studying her intently. She did not reply, but turned to Perkins.

"How are you, Mr. Perkins? Do you require medical attention?"

"No," growled Perkins from the seat in which he had crouched immediately after eating. "Keep away from me, or I'll cut your heart out!"

"Shut up!" snapped DuQuesne. "Remember what I said?"

"I haven't done anything," snarled the other.

"I said I would throw you out if you made another break," DuQuesne informed him evenly, "and I meant it. If you can't talk decently, keep still. Understand that you are to keep off Miss Vaneman, words and actions. I am in charge of her, and I will put up with no interference whatever. This is your last warning."

"How about Spencer, then?"

"I have nothing to say about her, she's not mine," responded DuQuesne with a shrug.

An evil light appeared in Perkins' eyes and he took out a wicked-looking knife and began to strop it carefully upon the leather of the seat, glaring at his victim the while.

"Well, I have something to say . . ." blazed Dorothy, but she was silenced by a gesture from Margaret,

who calmly took the pistol from her pocket, jerked the slide back, throwing a cartridge into the chamber, and held the weapon up on one finger, admiring it from all sides.

"DON'T worry about his knife. He has been sharpening it for my benefit for the last month. He doesn't mean anything by it."

At this unexpected show of resistance, Perkins stared at her for an instant, then glanced at his coat.

"Yes, this was yours, once. You needn't bother about picking up your coat, they're both gone. You might be tempted to throw that knife, so drop it on the floor and kick it over to me before I count three."

"One." The heavy pistol steadied into line with his chest and her finger tightened on the trigger.

"Two." He obeyed and she picked up the knife. He turned to DuQuesne, who had watched the scene unmoved, a faint smile upon his saturnine face.

"Doctor!" he cried, shaking with fear. "Why don't you shoot her or take that gun away from her? Surely you don't want to see me murdered?"

"Why not?" replied DuQuesne calmly. "It is nothing to me whether she kills you or you kill her. You brought it on yourself by your own carelessness. Any man with brains doesn't leave guns lying around within reach of prisoners, and a blind man could have seen Miss Vaneman getting your hardware."

"You saw her take them and didn't warn me?" croaked Perkins.

"Why should I warn you? If you can't take care of your own prisoner she earns her liberty, as far as I am concerned. I never did like your style, Perkins, especially your methods of handling—or rather mishandling—women. You could have made her give up the stuff she recovered from that ass Brookings inside of an hour, and wouldn't have had to kill her afterward, either."

"How?" sneered the other. "If you are so good at that kind of thing, why didn't you try it on Seaton and Crane?"

"There are seven different methods to use on a woman like Miss Spencer, each of which will produce the desired result. The reason I did not try them on either Seaton or Crane is that they would have failed. Your method of indirect action is probably the only one that will succeed. That is why I adopted it."

"Well, what are you going to do about it?" shrieked Perkins. "Are you going to sit there and lecture all day?"

"I am going to do nothing whatever," answered the scientist coldly. "If you had any brains you would see that you are in no danger. Miss Spencer will undoubtedly kill you if you attack her—not otherwise. That is an Anglo-Saxon weakness."

"Did you see me take the pistols?" queried Dorothy. "Certainly. I'm not blind. You have one of them in your right coat pocket now."

"Then why didn't you, or don't you, try to take it away from me?" she asked in wonder.

"If I had objected to your having them, you would never have got them. If I didn't want you to have a gun now, I would take it away from you. You know

that, don't you?" and his black eyes stared into her violet ones with such calm certainty of his ability that she felt her heart sink.

"Yes," she admitted finally, "I believe you could—that is, unless I were angry enough to shoot you."

"That wouldn't help you. I can shoot faster and straighter than you can, and would shoot it out of your hand. However, I have no objection to your having the gun, since it is no part of my plan to offer you any further indignity of any kind. Even if you had the necessary coldness of nerve or cruelty of disposition—of which I have one, Perkins the other, and you neither—you wouldn't shoot me now, because you can't get back to the earth without me. After we get back I will take the guns away from both of you if I think it desirable. In the meantime, play with them all you please."

"Has Perkins any more knives or guns or things in his room?" demanded Dorothy.

"How should I know?" indifferently; then, as both girls started for Perkins' room he ordered brusquely:

"Sit down, Miss Vaneman. Let them fight it out. Perkins has his orders to lay off you—you lay off him. I'm not taking any chances of getting you hurt, that's one reason I wanted you armed. If he gets gay, shoot him; otherwise, hands off completely."

Dorothy threw up her head in defiance, but meeting his cold stare she paused irresolutely and finally sat down, biting her lips in anger, while the other girl went on.

"That's better. She doesn't need any help to whip that yellow dog. He's whipped already. He never would think of fighting unless the odds were three to one in his favor."

WHEN Margaret had returned from a fruitless search of Perkins' room and had assured herself that he had no more weapons concealed about his person, she thrust the pistol back into her pocket and sat down.

"That ends that," she declared. "I guess you will be good now, won't you, Mr. Perkins?"

"Yes," that worthy muttered. "I have to be, now that you've got the drop on me and DuQuesne's gone back on me. But wait until we get back! I'll get you then, you . . ."

"Stop right there!" sharply. "There's nothing I would rather do than shoot you right now, if you give me the slightest excuse, such as that name you were about to call me. Now go ahead!"

DuQuesne broke the silence that followed.

"Well, now that the battle is over, and since we are fed and rested, I suggest that we slow down a bit and get ready to start back. Pick out comfortable seats, everybody, and I'll shoot a little more juice through that bar."

Seating himself before the instrument board, he advanced the speed lever slowly until nearly three-quarters of the full power was on, as much as he thought the others could stand.

For sixty hours he drove the car, reducing the acceleration only at intervals during which they ate and walked about their narrow quarters in order to restore

the blood to circulation in their suffering bodies. The power was not reduced for sleep; everyone slept as best he could.

Dorothy and Margaret talked together at every opportunity, and a real intimacy grew up between them. Perkins was for the most part sullenly quiet, knowing himself despised by all the others and having no outlet here for his particular brand of cleverness. DuQuesne was always occupied with his work and only occasionally addressed a remark to one or another of the party, except during meals. At those periods of general recuperation, he talked easily and well upon many topics. There was no animosity in his bearing nor did he seem to perceive any directed toward himself, but when any of the others ventured to infringe upon his ideas of how discipline should be maintained, DuQuesne's reproof was merciless. Dorothy almost liked him, but Margaret insisted that she considered him worse than ever.

When the bar was exhausted, DuQuesne lifted the sole remaining cylinder into place.

"We should be nearly stationary with respect to the earth," he remarked. "Now we will start back."

"Why, it felt as though we were picking up speed for the last three days!" exclaimed Margaret.

"Yes, it feels that way because we have nothing to judge by. Slowing down in one direction feels exactly like starting up in the opposite one. There is no means of knowing whether we are standing still, going away from the earth, or going toward it, since we have nothing stationary upon which to make observations. However, since the two bars were of exactly the same size and were exerted in opposite directions except for a few minutes after we left the earth, we are nearly stationary now. I will put on power until this bar is something less than half gone, then coast for three or four days. By the end of that time we should be able to recognize our solar system from the appearance of the fixed stars."

He again advanced the lever, and for many hours silence filled the car as it hurtled through space. DuQuesne, waking up from a long nap, saw that the bar no longer pointed directly toward the top of the ship, perpendicular to the floor, but was inclined at a sharp angle. He reduced the current, and felt the lurch of the car as it swung around the bar, increasing the angle many degrees. He measured the angle carefully and peered out of all the windows on one side of the car. Returning to the bar after a time, he again measured the angle, and found that it had increased greatly.

"What's the matter, Doctor DuQuesne?" asked Dorothy, who had also been asleep.

"We are being deflected from our course. You see the bar doesn't point straight up any more? Of course the direction of the bar hasn't changed, the car has swung around it."

"What does that mean?"

"We have come close enough to some star so that its attraction swings the bottom of the car around. Normally, you know, the bottom of the car follows directly behind the bar. It doesn't mean much yet except that we are being drawn away from our straight line, but if the attraction gets much stronger it may

make us miss our solar system completely. I have been looking for the star in question, but can't see it yet. We'll probably pull away from it very shortly."

He threw on the power, and for some time watched the bar anxiously, expecting to see it swing back into the vertical, but the angle continually increased. He again reduced the current and searched the heavens for the troublesome body.

"Do you see it yet?" asked Dorothy with concern.

"No, there's apparently nothing near enough to account for all this deflection."

He took out a pair of large night-glasses and peered through them for several minutes.

"Good God! It's a dead sun, and we're nearly onto it! It looks as large as our moon!"

Springing to the board, he whirled the bar into the vertical. He took down a strange instrument, went to the bottom window, and measured the apparent size of the dark star. Then, after cautioning the rest of the party to sit tight, he advanced the lever farther than it had been before. After half an hour he again slackened the pace and made another observation, finding to his astonishment that the dark mass had almost doubled its apparent size! Dorothy, noting his expression, was about to speak, but he forestalled her.

"We lost ground, instead of gaining, that spurt," he remarked, as he hastened to his post. "It must be inconceivably large, to exert such an enormous attractive force at this distance. We'll have to put on full power. Hang onto yourselves as best you can."

He then pushed the lever out to its last notch and left it there until the bar was nearly gone, only to find that the faint disk of the monster globe was even larger than before, being now visible to the unaided eye. Revived, the three others saw it plainly—a great dim circle, visible as is the dark portion of the new moon—and, the power shut off, they felt themselves falling toward it with sickening speed. Perkins screamed with mad fear and flung himself grovelling upon the floor. Margaret, her nerves still unstrung, clutched at her heart with both hands. Dorothy, though her eyes looked like great black holes in her white face, looked Duquesne in the eye steadily.

"This is the end, then?"

"Not yet," he replied in a calm and level voice. "The end will not come for a good many hours, as I have calculated that it will take at least two days, probably more, to fall the distance we have to go. We have all that time in which to think out a way of escape."

"Won't the outer repulsive shell keep up from striking it, or at least break the force of our fall?"

"No. It was designed only as protection from meteorites and other small bodies. It is heavy enough to swing us away from a small planet, but it will be used up long before we strike."

He lighted a cigarette and sat at ease, as though in his own study, his brow wrinkled in thought as he made calculations in his notebook. Finally he rose to his feet.

"There's only one chance that I can see. That is to gather up every scrap of copper we have and try to pull ourselves far enough out of line so that we will

take an hyperbolic orbit around that body instead of falling into it."

"What good will that do us?" asked Margaret, striving for self-control. "We will starve to death finally, won't we?"

"Not necessarily. That will give us time to figure out something else."

"You won't have to figure out anything else, Doctor," stated Dorothy positively. "If we miss that moon, Dick and Martin will find us before very long."

"Not in this life. If they tried to follow us, they're both dead before now."

"That's where even you are wrong!" she flashed at him. "They knew you were wrecking our machine, so they built another one, a good one. And they know a lot of things about this new metal that you have never dreamed of, since they were not in the plans you stole."

DUCQUESNE went directly to the heart of the matter, paying no attention to her barbed shafts.

"Can they follow us through space without seeing us?" he demanded.

"Yes—or at least, I think they can."

"How do they do it?"

"I don't know—I wouldn't tell you if I did."

"You'll tell if you know," he declared, his voice cutting like a knife. "But that can wait until after we get out of this. The thing to do now is to dodge that world."

He searched the vessel for copper, ruthlessly tearing out almost everything that contained the metal, hammering it flat and throwing it into the power-plant. He set the bar at right angles to the line of their fall and turned on the current. When the metal was exhausted, he made another series of observations upon the body toward which they were falling, and reported quietly:

"We made a lot of distance, but not enough. Everything goes in, this time."

He tore out the single remaining light-wire, leaving the car in darkness save for the diffused light of his electric torch, and broke up the only remaining motor. He then took his almost priceless Swiss watch, his heavy signet ring, his scarf pin, and the cartridges from his pistol, and added them to the collection. Flashing his lamp upon Perkins, he relieved him of everything he had which contained copper.

"I think I have a few pennies in my pocketbook," suggested Dorothy.

"Get 'em," he directed briefly, and while she was gone he searched Margaret, without result save for the cartridges in her pistol, as she had no jewelry remaining after her imprisonment. Dorothy returned and handed him everything she had found.

"I would like to keep this ring," she said slowly, pointing to a slender circlet of gold set with a solitaire diamond, "if you think there is any chance of us getting clear."

"Everything goes that has any copper in it," he said coldly, "and I am glad to see that Seaton is too good a chemist to buy any platinum jewelry. You may keep the diamond, though," as he wreathed the jewel out of its setting and returned it to her.

He threw all the metal into the central chamber and

the vessel gave a tremendous lurch as the power was again applied. It was soon spent, however, and after the final observation, the others waiting in breathless suspense for him to finish his calculations, he made his curt announcement.

"Not enough."

Perkins, his mind weakened by the strain of the last few days, went completely insane at the words. With a wild howl he threw himself at the unmoved scientist, who struck him with the butt of his pistol as he leaped, the mighty force of DuQuesne's blow crushing his skull like an eggshell and throwing him backward to the opposite side of the vessel. Margaret lay in her seat in a dead faint. Dorothy and DuQuesne looked at each other in the feeble light of the torch. To the girl's amazement, the man was as calm as though he were safe in his own house, and she made a determined effort to hold herself together.

"What next, Doctor DuQuesne?"

"I don't know. We have a couple of days yet, at least. I'll have to study awhile."

"In that time Dick will find us, I know."

"Even if they do find us in time, which I doubt, what good will it do? It simply means that they will go with us instead of saving us, for of course they can't pull away, since we couldn't. I hope they don't find us, but locate this star in time to keep away from it."

"Why?" she gasped. "You have been planning to kill both of them! I should think you would be delighted to take them with us?"

"Far from it. Please try to be logical. I intended to remove them because they stood in the way of my developing this new metal. If I am to be out of the way—and frankly, I see very little chance of getting out of this—I hope that Seaton goes ahead with it. It is the greatest discovery the world has ever known, and if both Seaton and I, the only two men in the world who know how to handle it, drop out, it will be lost for perhaps hundreds of years."

"If Dick's finding us means that he must go, too, of course I hope that he won't find us, but I don't believe that. I simply know that he could get us away from here."

She continued more slowly, almost speaking to herself, her heart sinking with her voice:

"He is following us, and he won't stop even if he does see this dead star and knows that he can't get away. We will die together."

"There's no denying the fact that our situation is critical, but you know a man isn't dead until after his heart stops beating. We have two whole days yet, and in that time, I can probably dope out some way of getting away from here."

"I hope so," she replied, keeping her voice from breaking only by a great effort. "But go ahead with your doping. I'm worn out." She drew herself down upon one of the seats and stared at the ceiling, fighting to restrain an almost overpowering impulse to scream.

Thus the hours wore by—Perkins dead; Margaret still unconscious; Dorothy lying in her seat, her thoughts a formless prayer, buoyed up only by her faith in God and in her lover; DuQuesne self-possessed,

smoking innumerable cigarettes, his keen mind grappling with its most desperate problem, grimly fighting until the very last instant of life—while the powerless space-car fell with an appalling velocity, faster and faster; falling toward that cold and desolate monster of the heaven.

CHAPTER X

The Rescue

SEATON and Crane drove the Skylark in the direction indicated by the unwavering object-compass with the greatest acceleration they could stand, each man taking a twelve-hour watch at the instrument board.

Now, indeed, did the Skylark justify the faith of her builders, and the two inventors, with an exultant certainty of their success, flew out beyond man's wildest imaginings. Had it not been for the haunting fear for Dorothy's safety, the journey would have been one of pure triumph, and even that anxiety did not prevent a profound joy in the enterprise.

"If that misguided mutt thinks he can pull off a stunt like that and get away with it, he's got another think coming," asserted Seaton, after making a reading on the other car after several days of the flight. "He went off half-cocked this time, for sure, and we've got him foul. We'd better put on some negative pretty soon, hadn't we, Mart? Only a little over a hundred light-years now."

Crane nodded agreement and Seaton continued:

"It'll take as long to stop, of course, as it has taken to get out here, and if we ram them—GOOD NIGHT! Let's figure it out as nearly as we can."

They calculated their own speed, and that of the other vessel, as shown by the various readings taken, and applied just enough negative acceleration to slow the Skylark down to the speed of the other space-car when they should come up with it. They smiled at each other in recognition of the perfect working of the mechanism when the huge vessel had spun, with a sickening lurch, through a complete half-circle, the instant the power was reversed. Each knew that they were actually traveling in a direction that to them seemed "down," but with a constantly diminishing velocity, even though they seemed to be still going "up" with an increasing speed.

Until nearly the end of the calculated time the two took turns as before, but as the time of meeting drew near both men were on the alert, taking readings on the object-compass every few minutes. Finally Crane announced:

"We are almost on them, Dick. They are so close that it is almost impossible to time the needle—less than ten thousand miles."

Seaton gradually increased the retarding force until the needle showed that they were very close to the other vessel and maintaining a constant distance from it. He then shut off the power, and both men hurried to the bottom window to search for the fleeing ship with their powerful night-glasses. They looked at each other in amazement as they felt themselves falling almost directly downward, with an astounding acceleration.

"What do you make of it, Dick?" asked Crane calmly, as he brought his glasses to his eyes and stared out into the black heavens, studded with multitudes of brilliant and unfamiliar stars.

"I don't make it at all, Mart. By the feel, I should say we were falling toward something that would make our earth look like a pin-head. I remember now that I noticed that the bus was getting a little out of plumb with the bar all this last watch. I didn't pay much attention to it, as I couldn't see anything out of the way. Nothing but a sun could be big enough to raise all this disturbance, and I can't see any close enough to be afraid of, can you?"

"No, and I cannot see the Steel space-car, either. Look sharp."

"Of course," Seaton continued to argue as he peered out into the night, "it is theoretically possible that a heavenly body can exist large enough so that it could exert even this much force and still appear no larger than an ordinary star, but I don't believe it is probable. Give me three or four minutes of visual angle and I'll believe anything, but none of these stars are big enough to have any visual angle at all. Furthermore . . ."

"There is at least half a degree of visual angle!" broke in his friend intensely. "Just to the left of that constellation that looks so much like a question mark. It is not bright, but dark, like a very dark moon—barely perceptible."

Seaton pointed his glass eagerly in the direction indicated.

"Great Cat!" he ejaculated. "I'll say that's some moon! Wouldn't that rattle your slats? And there's DuQuesne's bus, too, on the right edge. Get it?"

As they stood up, Seaton's mood turned to one of deadly earnestness, and a grave look came over Crane's face as the seriousness of their situation dawned upon them. Trained mathematicians both, they knew instantly that that unknown world was of inconceivable mass, and that their chance of escape was none too good, even should they abandon the other craft to its fate. Seaton stared at Crane, his fists clenched and drops of perspiration standing on his forehead. Suddenly, with agony in his eyes and in his voice, he spoke.

"Mighty slim chance of getting away if we go through with it, old man. . . . Hate like the devil . . . Have no right to ask you to throw yourself away, too."

"Enough of that, Dick. You had nothing to do with my coming; you could not have kept me away. We will see it through."

Their hands met in a fierce clasp, broken by Seaton, as he jumped to the levers with an intense:

"Well, let's get busy!"

In a few minutes they had reduced the distance until they could plainly see the other vessel, a small black circle against the faintly luminous disk. As it leaped into clear relief in the beam of his powerful searchlight, Seaton focused the great attractor upon the fugitive car and threw in the lever which released the full force of that mighty magnet, while Crane attracted the attention of the vessel's occupants by means of a momentary burst of solid machine-gun bullets, which he knew would glance harmlessly off the steel hull.

AFTER an interminable silence, DuQuesne drew himself out of his seat. He took a long inhalation, deposited the butt of his cigarette carefully in his ash tray, and made his way to his room. He returned with three heavy fur suits provided with air helmets, two of which he handed to the girls, who were huddled in a seat with their arms around each other. These suits were the armor designed by Crane for use in exploring the vacuum and the intense cold of dead worlds. Air-tight, braced with fine steel netting, and supplied with air at normal pressure from small tanks by automatic valves, they made their wearers independent of surrounding conditions of pressure and temperature.

"The next thing to do," DuQuesne stated calmly, "is to get the copper off the outside of the ship. That is the last resort, as it robs us of our only safeguard against meteorites, but this is the time for last-resort measures. I'm going after that copper. Put these suits on, as our air will leave as soon as I open the door, and practically an absolute vacuum and equally absolute zero will come in."

As he spoke, the ship was enveloped in a blinding glare and they were thrown flat as the vessel slowed down in its terrific fall. The thought flashed across DuQuesne's mind that they had already entered the atmosphere of that monster globe and were being slowed down and set afire by its friction, but he dismissed it as quickly as it had come—the light in that case would be the green of copper, not this bluish-white. His next thought was that there had been a collision of meteors in the neighborhood, and that their retardation was due to the outer coating. While these thoughts were flickering through his mind, they heard an insistent metallic tapping, which DuQuesne recognized instantly.

"A machine-gun!" he blurted in amazement. "How in . . ."

"It's Dick!" screamed Dorothy, with flashing eyes. "He's found us, just as I knew he would. You couldn't beat Dick and Martin in a thousand years!"

The tension under which they had been laboring so long suddenly released, the two girls locked their arms around each other in a half-hysterical outburst of relief. Margaret's meaningless words and Dorothy's incoherent praises of her lover and Crane mingled with their racking sobs as each fought to recover self-possession.

DuQuesne had instantly mounted to the upper window. Throwing back the cover, he flashed his torch rapidly. The glare of the searchlight was snuffed out and he saw a flashing light spell out in dots and dashes:

"Can you read Morse?"

"Yes," he signalled back. "Power gone, drifting into . . ."

"We know it. Will you resist?"

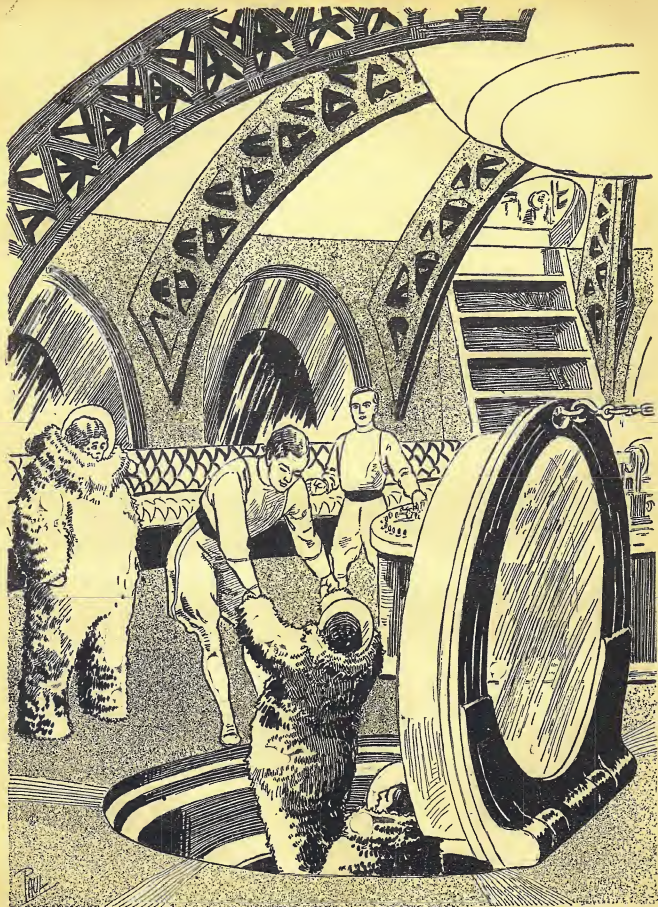
"No."

"Have you fur pressure-suits?"

"Yes."

"Put them on. Shut off your outer coating. Will touch so your upper door against our lower. Open, transfer quick."

"O. K."



DuQuenne seized her and tossed her lightly through the doorway in such a manner that she would not touch the metal, which would have frozen instantly anything coming into contact with it.

HASTILY returning to the main compartment, he briefly informed the girls as to what had happened. All three donned the suits and stationed themselves at the upper opening. Rapidly, but with unerring precision, the two ships were brought into place and held together by the attractor. As the doors were opened, there was a screaming hiss as the air of the vessels escaped through the narrow crack between them. The passengers saw the moisture in the air turn into snow, and saw the air itself first liquefy and then freeze into a solid coating upon the metal around the orifices at the touch of the frightful cold outside—the absolute zero of interstellar space, about four hundred sixty degrees below zero in the every-day scale of temperature. The moisture of their breath condensed upon the inside of the double glasses of their helmets, rendering sight useless.

Dorothy pushed the other girl ahead of her. DuQuesne seized her and tossed her lightly through the doorway in such a manner that she would not touch the metal, which would have frozen instantly anything coming into contact with it. Seaton was waiting. Feeling a woman's slender form in his arms, he crushed her to him in a mighty embrace, and was astonished to feel movements of resistance, and to hear a strange, girlish voice cry out:

"Don't! It's me! Dorothy's next!"

Releasing her abruptly, he passed her on to Martin and turned just in time to catch his sweetheart, who, knowing that he would be there and recognizing his powerful arms at the first touch, returned his embrace with a fierce intensity which even he had never suspected that she could exert. They stood motionless, locked in each other's arms, while DuQuesne dove through the opening and snapped the door shut behind him.

The air-pressure and temperature back to normal, the cumbersome suits were hastily removed, and Seaton's lips met Dorothy's in a long, clinging caress. DuQuesne's cold, incisive voice broke the silence.

"Every second counts. I would suggest that we go somewhere."

"Just a minute!" snapped Crane. "Dick, what shall we do with this murderer?"

Seaton had forgotten DuQuesne utterly in the joy of holding his sweetheart in his arms, but at his friend's words, he faced about and his face grew stern.

"By rights, we ought to chuck him back into his own tub and let him go to the devil," he said savagely, doubling his fists and turning swiftly.

"No, no, Dick," remonstrated Dorothy, seizing his arm. "He treated us very well, and saved my life once. Anyway, you mustn't kill him."

"No, I suppose not," grudgingly assented her lover, "and I won't, either, unless he gives me at least half an excuse."

"We might iron him to a post?" suggested Crane, doubtfully.

"I think there's a better way," replied Seaton. "He may be able to work his way. His brain hits on all twelve, and he's strong as a bull. Our chance of getting back isn't a certainty, as you know." He turned to DuQuesne.

"I've heard that your word is good"

"It has never been broken."

"Will you give your word to act as one of the party, for the good of us all, if we don't iron you?"

"Yes—until we get back to the earth. Provided, of course, that I reserve the right to escape at any time between now and then if I wish to and can do so without injuring the vessel or any member of the party in any way."

"Agreed. Let's get busy—we're altogether too close to that dud there to suit me. Sit tight, everybody, we're on our way!" he cried, as he turned to the board, applied one notch of power, and shut off the attractor. The Skylark slowed down a trifle in its mad haul, the other vessel continued on its way—a helpless hulk, manned by a corpse, falling to destruction upon the bleak wastes of a desert world.

"Hold on!" said DuQuesne sharply. "Your power is the same as mine was, in proportion to your mass, isn't it?"

"Yes."

"Then our goose is cooked. I couldn't pull away from it with everything I had, couldn't even swing out enough to make an orbit, either hyperbolic or elliptical around it. With a reserve bar you will be able to make an orbit, but you can't get away from it."

"Thanks for the dope. That saves our wasting some effort. Our power-plant can be doubled up in emergencies, thanks to Martin's cautious old bean. We'll simply double her up and go away from here."

"THERE is one thing we didn't consider quite enough," said Crane, thoughtfully. "I started to faint back there before the full power of even one motor was in use. With the motor doubled, each of us will be held down by a force of many tons—we would all be helpless."

"Yes," added Dorothy, with foreboding in her eyes, "we were all unconscious on the way out, except Dr. DuQuesne."

"Well, then, Blackie and I, as the huskiest members of the party, will give her the juice until only one of us is left with his eyes open. If that isn't enough to pull us clear, we'll have to give her the whole works and let her ramble by herself after we all go out. How about it, Blackie?" unconsciously falling into the old Bureau nickname, "Do you think we can make it stop at unconsciousness with double power on?"

DuQuesne studied the two girls carefully.

"With oxygen in the helmets instead of air, we all may be able to stand it. These special cushions keep the body from flattening out, as it normally would under such a pressure. The unconsciousness is simply a suffocation caused by the lateral muscles being unable to lift the ribs—in other words, the air-pumps aren't strong enough for the added work put upon them. At least we stand a chance this way. We may live through the pressure while we are pulling away, and we certainly shall die if we don't pull away."

After a brief consultation, the men set to work with furious haste. While Crane placed extra bars in each of the motors and DuQuesne made careful observations upon the apparent size of the now plainly visible

world toward which they were being drawn so irresistibly, Seaton connected the helmets with the air- and oxygen-tanks through a valve upon the board, by means of which he could change at will the oxygen content of the air they breathed. He then placed the strange girl, who seemed dazed by the frightful sensation of their never-ending fall, upon one of the seats, fitted the cumbersome helmet upon her head, strapped her carefully into place, and turned to Dorothy. In an instant they were in each other's arms. He felt her labored breathing and the wild beating of her heart, pressed so closely to his, and saw the fear of the unknown in the violet depths of her eyes, but she looked at him unflinchingly.

"Dick, sweetheart, if this is good-bye . . ."

He interrupted her with a kiss.

"It isn't good-bye yet, Dottie mine. This is merely a trial effort, to see what we will have to do to get away. Next time will be the time to worry."

"I'm not worried, really . . . but in case . . . you see . . . I . . . we . . ."

The gray eyes softened and misted over as he pressed his cheek to hers.

"I understand, sweetheart," he whispered. "This is not good-bye, but if we don't pull through we'll go together, and that is what we both want."

As Crane and DuQuesne finished their tasks, Seaton fitted his sweetheart's helmet, placed her tenderly upon the seat, buckled the heavy restraining straps about her slender body, and donned his own helmet. He took his place at the main instrument board, DuQuesne stationing himself at the other.

"What did you read on it, Blackie?" asked Seaton.

"Two degrees, one minute, twelve seconds diameter," replied DuQuesne. "Altogether too close for comfort. How shall we apply the power? One of us must stay awake, or we'll go on as long as the bars last."

"You put on one notch, then I'll put on one. We can feel the bus jump with each notch. We'll keep it up until one of us is so far gone that he can't raise the bar—the one that raises last will have to let the ship run for thirty minutes or an hour, then cut down his power. Then the other fellow will revive and cut his off, for an observation. How's that?"

"All right."

THEY took their places, and Seaton felt the vessel slow down in its horrible fall as DuQuesne threw his lever into the first notch. He responded instantly by advancing his own, and notch after notch the power applied to the ship by the now doubled motor was rapidly increased. The passengers felt their suits envelope them and began to labor for breath. Seaton slowly turned the mixing valve, a little with each advance of his lever, until pure oxygen flowed through the pipes. The power levers had moved scarcely half of their range, yet minutes now intervened between each advance instead of seconds, as at the start.

As each of the two men was determined that he would make the last advance, the duel continued longer than either would have thought possible. Seaton made what he thought his final effort and waited—only to feel, after a few minutes, the upward surge telling him

that DuQuesne was still able to move his lever. His brain reeled. His arm seemed paralyzed by its own enormous weight, and felt as though it, the rolling table upon which it rested, and the supporting framework were so immovably welded together that it was impossible to move it even the quarter-inch necessary to operate the ratchet-lever. He could not move his body, which was oppressed by a sickening weight. His utmost efforts to breathe forced only a little of the life-giving oxygen into his lungs, which smarted painfully at the touch of the undiluted gas, and he felt that he could not long retain consciousness under such conditions. Nevertheless, he summoned all his strength and advanced the lever one more notch. He stared at the clock-face above his head, knowing that if DuQuesne could advance his lever again he would lose consciousness and be beaten. Minute after minute went by, however, and the acceleration of the ship remained constant. Seaton, knowing that he was in sole control of the power-plant, fought to retain possession of his faculties, while the hands of the clock told off the interminable minutes.

After an eternity of time an hour had passed, and Seaton attempted to cut down his power, only to find with horror that the long strain had so weakened him that he could not reverse the ratchet. He was still able, however, to give the lever the backward jerk which disconnected the wires completely—and the safety straps creaked with the sudden stress as, half the power instantly shut off, the suddenly released springs tried to hurl five bodies against the ceiling. After a few minutes DuQuesne revived and slowly cut off his power. To the dismay of both men they were again falling!

DuQuesne hurried to the lower window to make the observation, remarking:

"You're a better man than I am, Gunga Din."

"Only because you're so badly bungled up. One more notch would've got my goat," replied Seaton frankly as he made his way to Dorothy's side. He noticed as he reached her, that Crane had removed his helmet and was approaching the other girl. By the time DuQuesne had finished the observation, the other passengers had completely recovered, apparently none the worse for their experience.

"DID we gain anything?" asked Seaton eagerly. "I make it two, four, thirteen. We've lost about two minutes of arc. How much power did we have on?"

"A little over half—thirty-two points out of sixty possible."

"We were still falling pretty fast. We'll have to put on everything we've got. Since neither of us can put it on we'll have to rig up an automatic feed. It'll take time, but it's the only way."

The automatic control is already there," put in Crane, forestalling Seaton's explanation. "The only question is whether we will live through it—and that is not really a question, since certain death is the only alternative. We must do it."

"We sure must," answered Seaton soberly.

Dorothy gravely nodded assent.

"What do you fellows think of a little plus pressure on the oxygen?" asked Seaton. "I think it would help a lot."

"I think it's a good idea," said DuQuesne, and Crane added:

"Four or five inches of water will be about all the pressure we can stand. Any more might burn our lungs too badly."

The pressure apparatus was quickly arranged and the motors filled to capacity with reserve bars—enough to last seventy-two hours—the scientists having decided that they must risk everything on one trial and put in enough, if possible, to pull them clear out of the influence of this center of attraction, as the time lost in slowing up to change bars might well mean the difference between success and failure. Where they might lie at the end of the wild dash for safety, how they were to retrace their way with their depleted supply of copper, what other dangers of dead star, planet, or sun lay in their path—all these were terrifying questions that had to be ignored.

DuQUESNE was the only member of the party who actually felt any calmness, the quiet of the others expressing their courage in facing fear. Life seemed very sweet and desirable to them, the distant earth a very Paradise! Through Dorothy's mind flashed the visions she had built up during long sweet hours, visions of a long life with Seaton. As she breathed an inaudible prayer, she glanced up and saw Seaton standing beside her, gazing down upon her with his very soul in his eyes. Never would she forget the expression upon his face. Even in that crucial hour, his great love for her overshadowed every other feeling, and no thought of self was in his mind—his care was all for her. There was a long farewell caress. Both knew that it might be goodbye, but both were silent as the violet eyes and the gray looked into each other's depths and conveyed messages far beyond the power of words. Once more he adjusted her helmet and strapped her into place.

As Crane had in the meantime cared for the other girl, the men again took their places and Seaton started the motor which would automatically adjust the speed levers, one notch every five seconds, until the full power of both motors was exerted. As the power was increased, he turned the valve as before, until the helmets were filled with pure oxygen under a pressure of five inches of water.

Margaret Spencer, weakened by her imprisonment, was the first to lose consciousness, and soon afterward Dorothy felt her senses leave her. A half-minute, in the course of which six mighty surges were felt, as more of the power of the doubled motor was released, and Crane had gone, calmly analyzing his sensations to the last. After a time DuQuesne also lapsed into unconsciousness, making no particular effort to avoid it, as he knew that the involuntary muscles would function quite as well without the direction of the will. Seaton, although he knew it was useless, fought to keep his senses as long as possible, counting the impulses he felt as the levers were advanced.

"Thirty-two." He felt exactly as he had before,

when he had advanced the lever for the last time.

"Thirty-three." A giant hand shut off his breath completely, though he was fighting to his utmost for air. An intolerable weight rested upon his eyeballs, forcing them backward into his head. The universe whirled about him in dizzy circles—orange and black and green stars flashed before his bursting eyes.

"Thirty-four." The stars became more brilliant and of more variegated colors, and a giant pen dipped in fire was writing equations and mathematico-chemical symbols upon his quivering brain. He joined the circling universe, which he had hitherto kept away from him by main strength, and whirled about his own body, tracing a logarithmic spiral with infinite velocity—leaving his body an infinite distance behind.

"Thirty-five." The stars and the fiery pen exploded in a wild coruscation of searing, blinding light and he plunged from his spiral into a black abyss.

IN spite of the terrific stress put upon the machine, every part functioned perfectly, and soon after Seaton had lost consciousness the vessel began to draw away from the sinister globe; slowly at first, faster and faster as more and more of the almost unlimited power of the mighty motor was released. Soon the levers were out to the last notch and the machine was exerting its maximum effort. One hour and an observer upon the Skylark would have seen that the apparent size of the massive unknown world was rapidly decreasing; twenty hours and it was so far away as to be invisible, though its effect was still great; forty hours and the effect was slight; sixty hours and the Skylark was out of range of the slightest measurable force of the monster it had left.

Hurled onward by the inconceivable power of the unleashed copper demon in its center, the Skylark flew through the infinite reaches of interstellar space with an unthinkable, almost incalculable velocity—beside which the velocity of light was as that of a snail to that of a rifle bullet; a velocity augmented every second by a quantity almost double that of light itself.

CHAPTER XI

Through Space Into the Carboniferous

SEATON opened his eyes and gazed about him wonderingly. Only half conscious, bruised and sore in every part of his body, he could not at first realize what had happened. Instinctively drawing a deep breath, he coughed and choked as the undiluted oxygen filled his lungs, bringing with it a complete understanding of the situation. Knowing from the lack of any apparent motion that the power had been sufficient to pull the car away from that fatal globe, his first thought was for Dorothy, and he tore off his helmet and turned toward her. The force of even that slight movement, wafted him gently into the air, where he hung suspended several minutes before his struggles enabled him to clutch a post and draw himself down to the floor. A quick glance around informed him that Dorothy, as well as the others, was still unconscious. Making his way rapidly to her, he

placed her face downward upon the floor and began artificial respiration. Very soon he was rewarded by the coughing he had longed to hear. He tore off her helmet and clasped her to his breast in an agony of relief, while she sobbed convulsively upon his shoulder. The first ecstasy of their greeting over, Dorothy started guiltily.

"Oh, Dick!" she exclaimed. "How about Peggy? You must see how she is!"

"Never mind," answered Crane's voice cheerily. "She is coming to nicely."

Glancing around quickly, they saw that Crane had already revived the stranger, and that DuQuesne was not in sight. Dorothy blushed, the vivid wave of color rising to her glorious hair, and hastily disengaged her arms from around her lover's neck, drawing away from him. Seaton, also blushing, dropped his arms, and Dorothy floated away from him, frantically clutching at a brace just beyond reach.

"Pull me down, Dick!" she called, laughing gaily.

Seaton, seizing her instinctively, neglected his own anchorage and they hung in the air together, while Crane and Margaret, each holding a strap, laughed with unrestrained merriment.

"Tweet, tweet—I'm a canary!" chuckled Seaton. "Throw us a rope!"

"A Dicky-bird, you mean," interposed Dorothy.

"I knew that you were a sleight-of-hand expert, Dick, but I did not know that levitation was one of your specialties," remarked Crane with mock gravity. "That is a peculiar pose you are holding now. What are you doing—sitting on an imaginary pedestal?"

"I'll be sitting on your neck if you don't get a wiggle on with that rope!" retorted Seaton, but before Crane had time to obey the command the floating couple had approached close enough to the ceiling so that Seaton, with a slight pressure of his hand against the leather, sent them floating back to the floor, within reach of one of the handrails.

Seaton made his way to the power-plant, lifted in one of the remaining bars, and applied a little power. The Skylark seemed to jump under them, then it seemed as though they were back on Earth—everything had its normal weight once more, as the amount of power applied was just enough to equal the acceleration of gravity. After this fact had been explained, Dorothy turned to Margaret.

"Now that we are able to act intelligently, the party should be introduced to each other. Peggy, this is Dr. Dick Seaton, and this is Mr. Martin Crane. Boys, this is Miss Margaret Spencer, a dear friend of mine. These are the boys I have told you so much about, Peggy. Dick knows all about atoms and things; he found out how to make the Skylark go. Martin, who is quite a wonderful inventor, made the engines and things for it."

"I may have heard of Mr. Crane," replied Margaret eagerly. "My father was an inventor, and I have heard him speak of a man named Crane who invented a lot of instruments for airplanes. He used to say that the Crane instruments revolutionized flying. I wonder if you are that Mr. Crane?"

"That is rather unjustifiably high praise, Miss Spen-

cer," replied Crane, "but as I have been guilty of one or two things along that line, I may be the man he meant."

"Pardon me if I seem to change the subject," put in Seaton, "but where's DuQuesne?"

"We came to at the same time, and he went into the galley to fix up something to eat."

"Good for him!" exclaimed Dorothy. "I'm simply starved to death. I would have been demanding food long ago, but I have so many aches and pains that I didn't realize how hungry I was until you mentioned it. Come on, Peggy, I know where our room is. Let's go powder our noses while these bewhiskered gentlemen reap their beads. Did you bring along any of my clothes, Dick, or did you forget them in the excitement?"

"I didn't think anything about clothes, but Martin did. You'll find your whole wardrobe in your room. I'm with you, Dot, on that eating proposition—I'm hungry enough to eat the jamb off the door!"

AFTER the girls had gone, Seaton and Crane went to their rooms, where they exercised vigorously to restore the circulation to their numbed bodies, shaved, bathed, and returned to the saloon feeling like new men. They found the girls already there, seated at one of the windows.

"Hail and greeting!" cried Dorothy at sight of them. "I hardly recognized you without your whiskers. Do hurry over here and look out this perfectly wonderful window. Did you ever in your born days see anything like this sight? Now that I'm not scared pea-green, I can enjoy it thoroughly!"

The two men joined the girls and peered out into space through the window, which was completely invisible, so clear was the glass. As the four heads bent, so close together, an awed silence fell upon the little group. For the blackness of the interstellar void was not the dark of an earthly night, but the absolute black of the absence of all light, beside which the black of platinum dust is pale and gray; and laid upon this velvet were the jewel stars. They were not the twinkling, scintillating beauties of the earthly sky, but minute points, so small as to seem dimensionless, yet of dazzling brilliance. Without the interference of the air, their rays met the eye steadily and much of the effect of comparative distance was lost. All seemed nearer and there was no hint of familiarity in their arrangement. Like gems thrown upon darkness they shone in multi-colored beauty upon the daring wanderers, who stood in their car as easily as though they were upon their parent Earth, and gazed upon a sight never before seen by eye of man nor pictured in his imaginings.

Through the daze of their wonder, a thought smote Seaton like a blow from a fist. His eyes leaped to the instrument board and he exclaimed:

"Look there, Mart! We're heading almost directly away from the Earth, and we must be making billions of miles per second. After we lost consciousness, the attraction of that big dud back there would swing us around, of course, but the bar should have stayed pointed somewhere near the Earth, as I left it. Do you suppose it could have shifted the gyroscopes?"

"It not only could have, it did," replied Crane, turning the bar until it again pointed parallel with the object-compass which bore upon the Earth. "Look at the board. The angle has been changed through nearly half a circumference. We couldn't carry gyroscopes heavy enough to counteract that force."

"But they were heavier there—Oh, sure, you're right. It's mass, not weight, that counts. But we sure are in one fine, large jam now. Instead of being half-way back to the Earth we're—where are we, anyway?"

They made a reading on an object-compass focused upon the Earth. Seaton's face lengthened as seconds passed. When it had come to rest, both men calculated the distance.

"What d'you make it, Mart? I'm afraid to tell you my result."

"Forty-six point twenty-seven light-centuries," replied Crane, calmly. "Right?"

"Right, and the time was 11:32 P. M. of Thursday, by the chronometer there. We'll time it again after a while and see how fast we're traveling. It's a good thing you built the ship's chronometers to stand any kind of stress. My watch is a total loss. Yours is, too?"

"All of our watches must be broken. We will have to repair them as soon as we get time."

"Well, let's eat next! No human being can stand my aching void much longer. How about you, Dot?"

"Yes, for Cat's sake, let's get busy!" she mimicked him gaily. "Doctor DuQuesne's had dinner ready for ages, and we're all dying by inches of hunger."

THE wanderers, battered, bruised, and sore, seated themselves at a folding table, Seaton keeping a watchful eye upon the bar and upon the course, while enjoying Dorothy's presence to the full. Crane and Margaret talked easily, but at intervals. Was when directly addressed, DuQuesne maintained silence—not the silence of one who knows himself to be an intruder, but the silence of perfect self-sufficiency. The meal over, the girls washed the dishes and busied themselves in the galley. Seaton and Crane made another observation upon the Earth, requesting DuQuesne to stay out of the "engine room" as they called the partially-enclosed space surrounding the main instrument board, where were located the object-compasses and the mechanism controlling the attractor, about which DuQuesne knew nothing. As they rejoined DuQuesne in the main compartment, Seaton said:

"DuQuesne, we're nearly five thousand light-years away from the Earth, and are getting farther at the rate of about one light-year per minute."

"I suppose that it would be poor technique to ask how you know?"

It would—very poor. Our figures are right. The difficulty is that we have only four bars left—enough to stop us and a little to spare, but not nearly enough to get back with, even if we could take a chance on drifting straight that far without being swung off—which, of course, is impossible."

"That means that we must land somewhere and dig some copper, then."

"Exactly.

"The first thing to do is to find a place to land."

Seaton picked out a distant star in their course and observed it through the spectroscope. Since it was found to contain copper in notable amounts, all agreed that its planets probably also contained copper.

"Don't know whether we can stop that soon or not," remarked Seaton as he set the levers, "but we may as well have something to shoot at. We'd better take our regular twelve-hour tricks, hadn't we, Mart? It's a wonder we got as far as this without striking another snag. I'll take the first trick at the board—beat it to bed."

"Not so fast, Dick," argued Crane, as Seaton turned toward the engine-room. "It's my turn."

"Flip a nickel," suggested Seaton. "Heads I get it."

Crane flipped a coin. Heads it was, and the worn-out party went to their rooms, all save Dorothy, who lingered after the others to bid her lover a more intimate good-night."

Seated beside him, his arm around her and her head upon his shoulder, Dorothy exclaimed:

"Oh, Dicky, Dicky, it is wonderful to be with you again! I've lived as many years in the last week as we have covered miles!"

Seaton kissed her with ardor, then turned her fair face up to his and gazed hungrily at every feature.

"It sure was awful until we found you, sweetheart girl. Those two days at Wilson's were the worst and longest I ever put in. I could have wrung Martin's cautious old neck!

"But isn't he a wiz at preparing for trouble? We sure owe him a lot, little dimpled lady."

Dorothy was silent for a moment, then a smile quirked at one corner of her mouth and a dimple appeared. Seaton promptly kissed it, whereupon it deepened audaciously.

"What are you thinking about—mischief?" he asked. "Only of how Martin is going to be paid what we owe him," she answered teasingly. "Don't let the debt worry you any."

"Spill the news, Reddy," he commanded, as his arm tightened about her.

She stuck out a tiny tip of red tongue at him.

"Don't let Peggy find out he's a millionaire."

"Why not?" he asked wonderingly, then he saw her point and laughed:

"You little matchmaker!"

"I don't care, laugh if you want to. Martin's as nice a man as I know, and Peggy's a real darling. Don't you let slip a word about Martin's money, that's all!"

"She wouldn't think any less of him, would she?"

"Dick, sometimes you are absolutely dumb. It would spoil everything. If she knew he was a millionaire she would be scared to death—not of him, of course, but because she would think that he would think that she was chasing him, and then of course he would think that she was, see? As it is, she acts perfectly natural, and so does he. Didn't you notice that while we were eating they talked together for at least fifteen minutes about her father's invention and the way they stole the plans and one thing and another? I don't believe he has talked that much to any girl except me the last five

years—and he wouldn't talk to me until he knew that I couldn't see any man except you. Much as we like Martin, we've got to admit that about him. He's been chased so much that he's wild. If any other girl he knows had talked to him that long, he would have been off to the North Pole or somewhere the next morning, and the best part of it is that he didn't think anything of it."

"YOU think she is domesticating the wild man?"

"Now, Dick, don't be foolish. You know what I mean. Martin is a perfect dear, but if she knew that he is the M. Reynolds Crane, everything would be ruined. You know yourself how horribly hard it is to get through his shell to the real Martin underneath. He is lonely and miserable inside, I know, and the right kind of girl, one that would treat him right, would make life Heaven for him, and herself too."

"Yes, and the wrong kind would make it . . ."

"She would," interrupted Dorothy hastily, "but Peggy's the right kind. Wouldn't it be fine to have Martin and Peggy as happy, almost, as you and I are?"

"All right, girlie, I'm with you," he answered, embracing her as though he intended never to let her go, "but you'd better go get some sleep—you're all in."

Considerably later, when Dorothy had finally gone, Seaton settled himself for the long vigil. Promptly at the end of the twelve hours Crane appeared, alert of eye and of bearing.

"You look fresh as a daisy, Mart. Feeling fit?"

"Fit as the proverbial fiddle. I could not have slept any better or longer if I had had a week off. Seven hours and a half is a luxury, you know."

"All wrong, old top. I need eight every night, and I'm going to take about ten this time."

"Go to it, twelve if you like. You have earned it."

Seaton stumbled to his room and slept as though in a trance for ten hours. Rising, he took his regular morning exercises and went into the saloon. All save Martin were there, but he had eyes only for his sweetheart, who was radiantly beautiful in a dress of deep bronze-brown.

"Good morning, Dick," she hailed him joyously. "You woke up just in time—we are all starving again, and were just going to eat without you!"

"Good morning, everybody. I would like to eat with you, Dottie, but I've got to relieve Martin. How'd it be for you to bring breakfast into the engine room and cheer my solitude, and let Crane eat with the others?"

"Fine—that's once you had a good idea, if you never have another!"

After the meal DuQuesne, who abhorred idleness with all his vigorous nature, took the watches of the party and went upstairs to the "shop," which was a completely-equipped mechanical laboratory, to repair them. Seaton stayed at the board, where Dorothy joined him as a matter of course. Crane and Margaret sat down at one of the windows.

She told him her story, frankly and fully, shuddering with horror as she recalled the awful, helpless fall, during which Perkins had met his end.

"Dick and I have a heavy score to settle with that

Steel crowd and with DuQuesne," Crane said slowly. "We have no evidence that will hold in law, but some day DuQuesne will over-reach himself. We could convict him of abduction now, but the penalty for that is too mild for what he has done. Perkins' death was not murder, then?"

"Oh, no, it was purely self-defense. Perkins would have killed him if he could. And he really deserved it—Perkins was a perfect fiend. The Doctor, as they call him, is no better, although entirely different. He is so utterly heartless and ruthless, so cold and scientific. Do you know him very well?"

"We know all that about him, and more. And yet Dorothy said he saved her life?"

"He did, from Perkins, but I still think it was because he didn't want Perkins meddling in his affairs. He seems to me to be the very incarnation of a fixed purpose—to advance himself in the world."

"That expresses my thoughts exactly. But he slips occasionally, as in this instance, and he will again. He will have to walk very carefully while he is with us. Nothing would please Dick better than an excuse for killing him, and I must admit that I feel very much the same way."

"Yes, all of us do, and the way he acts proves what a machine he is. He knows just exactly how far to go, and never goes beyond it."

They felt the Skylark lurch slightly.

"Oh, Mart!" called Seaton. "Going to pass that star we were headed for—too fast to stop. I'm giving it a wide berth and picking out another one. There's a big planet a few million miles off in line with the main door, and another one almost dead ahead—that is, straight down. We sure are traveling. Look at that sun flit by!"

THEY saw the two planets, one like a small moon, the other like a large star, and saw the strange sun increase rapidly in size as the Skylark flew on at such a pace that any earthly distance would have been covered as soon as it was begun. So appalling was their velocity that their ship was bathed in the light of that sun for only a short time, then was again surrounded by the indescribable darkness. Their seventy-two-hour flight without a pilot had seemed a miracle, now it seemed entirely possible that they might fly in a straight line for weeks without encountering any obstacle, so vast was the emptiness in comparison with the points of light that punctuated it. Now and then they passed so close to a star that it apparently moved rapidly, but for the most part the silent sentinels stood, like distant mountain peaks to the travelers in an express train, in the same position for many minutes.

Awed by the immensity of the universe, the two at the window were silent, not with the silence of embarrassment, but with that of two friends in the presence of something beyond the reach of words. As they stared out into the infinity each felt as never before the pitiful smallness of even our whole solar system and the utter insignificance of human beings and their works. Silently their minds reached out to each other in mutual understanding.

Unconsciously Margaret half shuddered and moved

closer to her companion, the movement attracting his attention but not her own. A tender expression came into Crane's steady blue eyes as he looked down at the beautiful young woman by his side. For beautiful she undoubtedly was. Untroubled rest and plentiful food had erased the marks of her imprisonment; Dorothy's deep, manifestly unassuming faith in the ability of Seaton and Crane to bring them safely back to Earth had quieted her fears; and a complete costume of Dorothy's simple but well-cut clothes, which fitted her perfectly, and in which she looked her best and knew it, had completely restored her self-possession. He quickly glanced away and again gazed at the stars, but now, in addition to the wonders of space, he saw masses of wavy black hair, high-piled upon a queenly head; deep down brown eyes half veiled by long, black lashes; sweet, sensitive lips; a firmly rounded but dimpled chin; and a perfectly-formed young body.

After a time she drew a deep, tremulous breath. As he turned, her eyes met his. In their shadowy depths, still troubled by the mystery of the unknowable, he read her very soul—the soul of a real woman.

"I had hoped," said Margaret slowly, "to take a long flight above the clouds, but anything like this never entered my mind. How unbelievably great it is! So much vaster than any perception we could get upon earth! It seems strange that we were ever awed by the sea or the mountains . . . and yet . . ."

She paused, with her lip caught under two white teeth, then went on hesitatingly:

"Doesn't it seem to you, Mr. Crane, that there is something in man as great as all this? Otherwise, Dorothy and I could not be sailing here in a wonder like the Lark, which you and Dick Seaton have made."

SINCE from the first, Dorothy had timed her waking hours with those of Seaton—waiting upon him, preparing his meals, and lightening the long hours of his vigils at the board—Margaret took it upon herself to do the same thing for Crane. But often they assembled in the engine-room, and there was much fun and laughter, as well as serious talk, among the four. Margaret was quickly accepted as a friend, and proved a delightful companion. Her wavy, jet-black hair, the only color in the world that could hold its own with Dorothy's auburn glory, framed features self-reliant and strong, yet of womanly softness; and in this genial atmosphere her quick tongue had a delicate wit and a facility of expression that delighted all three. Dorothy, after the manner of Southern women, became the hostess of this odd "party," as she styled it, and unconsciously adopted the attitude of a lady in her own home.

Early in their flight, Crane suggested that they should take notes upon the systems of stars through which they were passing.

"I know very little of astronomy," he said to Seaton, "but with our telescope, spectroscope, and other instruments, we should be able to take some data that will be of interest to astronomers. Possibly Miss Spencer would be willing to help us?"

"Sure," Seaton returned readily. "We'd be idiots to let a chance like this slide. Go to it!"

Margaret was delighted at the opportunity to help.

"Taking notes is the best thing I do!" she cried, and called for a pad and pencil.

Stationed at the window, they fell to work in earnest. For several hours Crane took observations, calculated distances, and dictated notes to Margaret.

"The stars are wonderfully different!" she exclaimed to him once. "That planet, I'm sure, has strange and lovely life upon it. See how its color differs from most of the others we have seen so near? It is rosy and soft like a home fire. I'm sure its people are happy."

They fell into a long discussion, laughing a little at their fancies. Were these multitudes of worlds peopled as the Earth? Could it be that only upon Earth had occurred the right combination for the generation of life, so that the rest of the Universe was unpeopled?

"It is unthinkable that they are all uninhabited," mused Crane. "There must be life. The beings may not exist in any form with which we are familiar—they may well be fulfilling some purpose in ways so different from ours that we should be unable to understand them at all."

Margaret's eyes widened in startled apprehension, but in a moment she shook herself and laughed.

"But there's no reason to suppose they would be awful," she remarked, and turned with renewed interest to the window.

Thus days went by and the Skylark passed one solar system after another, with a velocity so great that it was impossible to land upon any planet. Margaret's association with Crane, begun as a duty, soon became an intense pleasure for them both. Taking notes or seated at the board in companionable conversation or sympathetic silence, they compressed into a few days more real companionship than is ordinarily enjoyed in months. Oftener and oftener, as time went on, Crane found the vision of his dream home floating in his mind as he steered the Skylark in her meteoric flight or as he strapped himself into his narrow bed. Now, however, the central figure of the vision, instead of being an indistinct blur, was clear and sharply defined. And for her part, more and more was Margaret drawn to the quiet and unassuming, but utterly dependable and steadfast young inventor, with his wide knowledge and his keen, incisive mind.

SOMETIMES, when far from any star, the pilot would desert his post and join the others at meals. Upon one such occasion Seaton asked:

"How's the book on astronomy, oh, learned ones?"

"It will be as interesting as Egyptian hieroglyphics," Margaret replied, as she opened her notebook and showed him pages of figures and symbols.

"May I see it, Miss Spencer?" asked DuQuesne from across the small table, extending his hand.

She looked at him, hot hostility in her brown eyes, and he dropped his hand.

"I beg your pardon," he said, with amused irony.

After the meal Seaton and Crane held a short consultation, and the former called to the girls, asking them to join in the "council of war." There was a moment's silence before Crane said diffidently:

"We have been talking about DuQuesne, Miss

Spencer, trying to decide a very important problem."

Seaton smiled in spite of himself as the color again deepened in Margaret's face, and Dorothy laughed outright.

"Talk about a red-headed temper! Your hair must be dyed, Peggy!"

"I know I acted like a naughty child," Margaret said ruefully, "but he makes me perfectly furious and scares me at the same time. A few more remarks like that 'I beg your pardon' of his and I wouldn't have a thought left in my head!"

Seaton, who had opened his mouth, shut it again ludicrously, without saying a word, and Margaret gave him a startled glance.

"Now I *have* said it!" she exclaimed. "I'm not afraid of him, boys, really. What do you want me to do?"

Seaton plunged in.

"What we were trying to get up nerve enough to say is that he'd be a good man on the astronomy job," and Crane added quickly:

"He undoubtedly knows more about it than I do, and it would be a pity to lose the chance of using him. Besides, Dick and I think it rather dangerous to leave him so much time to himself, in which to work up a plan against us."

"He's cooking one right now, I'll bet a hat," Seaton put in, and Crane added:

"If you are sure that you have no objections, Miss Spencer, we might go below, where we can have it dark, and all three of us see what we can make of the stargazing. We are really losing an unusual opportunity."

Margaret hid gallantly any reluctance she might have felt.

"I wouldn't deserve to be here if I can't work with the Doctor and hate him at the same time."

"Good for you, Peg, you're a regular fellow!" Seaton exclaimed. "You're a trump!"

FINALLY, the enormous velocity of the cruiser was sufficiently reduced to effect a landing, a copper-bearing sun was located, and a course was laid toward its nearest planet.

As the vessel approached its goal a deep undercurrent of excitement kept all the passengers feverishly occupied. They watched the distant globe grow larger, glowing through its atmosphere more and more clearly as a great disk of white light, its outline softened by the air about it. Two satellites were close beside it. Its sun, a great, blazing orb, a little nearer than the planet, looked so great and so hot that Margaret became uneasy.

"Isn't it dangerous to get so close, Dick? We might burn up, mightn't we?"

"Not without an atmosphere," he laughed.

"Oh," murmured the girl apologetically, "I might have known that."

Dropping rapidly into the atmosphere of the planet, they measured its density and analyzed it in apparatus installed for that purpose, finding that its composition was very similar to the Earth's air and that its pressure was not enough greater to be uncomfortable. When within one thousand feet of the surface, Seaton weighed a five-pound weight upon a spring-balance,

finding that it weighed five and a half pounds, thus ascertaining that the planet was either somewhat larger than the Earth or more dense. The ground was almost hidden by a rank growth of vegetation, but here and there appeared glade-like openings.

Seaton glanced at the faces about him. Tense interest marked them all. Dorothy's cheeks were flushed, her eyes shone. She looked at him with awe and pride.

"A strange world, Dorothy," he said gravely. "You are not afraid?"

"Not with you," she answered. "I am only thrilled with wonder."

"Columbus at San Salvador," said Margaret, her dark eyes paying their tribute of admiration.

A dark flush mounted swiftly into Seaton's brown face and he sought to throw most of the burden upon Crane, but catching upon his face also a look of praise, almost of tenderness, he quickly turned to the controls.

"Man the boats!" he ordered an imaginary crew, and the Sleylark descended rapidly.

Landing upon one of the open spaces, they found the ground solid and stepped out. What had appeared to be a glade was in reality a rock, or rather, a ledge of apparently solid metal, with scarcely a loose fragment to be seen. At one end of the ledge rose a giant tree, wonderfully symmetrical, but of a peculiar form. Its branches were longer at the top than at the bottom, and it possessed broad, dark-green leaves, long thorns, and odd, flexible, shoot-like tendrils. It stood as an out-post of the dense vegetation beyond. Totally unlike the forests of Earth were those fern-like trees, towering two hundred feet into the air. They were of an intensely vivid green and stood motionless in the still, hot air of noonday. Not a sign of animal life was to be seen; the whole landscape seemed asleep.

The five strangers stood near their vessel, conversing in low tones and enjoying the sensation of solid ground beneath their feet. After a few minutes DuQuesne remarked:

"This is undoubtedly a newer planet than ours. I should say that it was in the Carboniferous age. Aren't those trees like those in the coal-measures, Seaton?"

"True as time, Blackie—there probably won't be a human race here for ages, unless we bring out some colonists."

Seaton kicked at one of the loose lumps of metal questioningly with his heavy shoe, finding that it was as immovable as though it were part of the ledge. Bending over, he found that it required all his great strength to lift it and he stared at it with an expression of surprise, which turned to amazement as he peered closer.

"DuQuesne! Look at this!"

DUQUESNE studied the metal, and was shaken out of his habitual teiturnity.

"Platinum, by all the little gods!"

"We'll grab some of this while the grabbing's good," announced Seaton, and the few visible lumps were rolled into the car. "If we had a pickaxe we could chop some more off one of those sharp ledges down there."

"There's an axe in the shop," replied DuQuesne. "I'll go get it. Go ahead, I'll soon be with you."

"Keep close together," warned Crane as the four

moved slowly down the slope. "This is none too safe, Dick."

"No, it isn't, Mart. But we've got to see whether we can't find some copper, and I would like to get some more of this stuff, too. I don't think it's platinum, I believe that it's X."

As they reached the broken projections, Margaret glanced back over her shoulder and screamed. The others saw that her face was white and her eyes wide with horror, and Seaton instinctively drew his pistol as he whirled about, only to check his finger on the trigger and lower his hand.

"Nothing but X-plusive bullets," he growled in disgust, and in helpless silence the four watched an unspeakably hideous monster slowly appear from behind the Skylark. Its four huge, squat legs supported a body at least a hundred feet long, puffy and ungainly; at the extremity of a long and sinuous neck a comparatively small head seemed composed entirely of a cavernous mouth armed with row upon row of carnivorous teeth. Dorothy gasped with terror and both girls shrank closer to the two men, who maintained a baffled silence as the huge beast passed his revolting head along the hull of the vessel.

"I dare not shoot, Martin," Seaton whispered, "it would wreck the bus. Have you got any solid bullets?"

"No. We must hide behind these small ledges until it goes away," answered Crane, his eyes upon Margaret's colorless face. "You two hide behind that one, we will take this one."

"Oh, well, it's nothing to worry about, anyway. We can kill him as soon as he gets far enough away from the boat," said Seaton as, with Dorothy clinging to him, he dropped behind one of the ledges. Margaret, her staring eyes fixed upon the monster, remained standing until Crane touched her gently and drew her down beside him.

"He will go away soon," his even voice assured her. "We are in no danger."

In spite of their predicament, a feeling of happiness flowed through Crane's whole being as he crouched behind the wall of metal with one arm protectively around Margaret, and he longed to protect her through life as he was protecting her then. Accustomed as he was to dangerous situations, he felt no fear. He felt only a great tenderness for the girl by his side, who had ceased trembling but was still staring wide-eyed at the monster through a crevice.

"Scared, Peggy?" he whispered.

"Not now, Martin, but if you weren't here I would die of fright."

At this reply his arm tightened involuntarily, but he forced it to relax.

"It will not be long," he promised himself silently, "until she is back at home, among her friends, and then . . ."

There came the crack of a rifle from the Skylark. There was an awful roar from the dinosaur, which was quickly silenced by a stream of machine-gun bullets.

"Blackie's on the job—let's go!" cried Seaton, and they raced up the slope. Making a detour to avoid the writhing and mutilated mass, they plunged through the opening door. DuQuesne shut it behind them and in

overwhelming relief, the adventurers huddled together as from the wilderness without there arose an appalling tumult.

THE scene, so quiet a few moments before, was instantly changed. The trees, the swamp, and the air seemed filled with monsters so hideous as to stagger the imagination. Winged lizards of prodigious size hurtled through the air, plunging to death against the armored hull. Indescribable flying monsters, with feathers like birds, but with the fangs of tigers, attacked viciously. Dorothy screamed and started back as a scorpion-like thing with a body ten feet in length leaped at the window in front of her, its terrible sting spraying the glass with venom. As it fell to the ground, a huge spider—if an eight-legged creature with spines instead of hair, many-faceted eyes, and a bloated, globular body weighing hundreds of pounds, may be called a spider—leaped upon it and, mighty mandibles against poisonous sting, the furious battle raged. Several twelve-foot cockroaches climbed nimbly across the fallen timber of the morass and began feeding voraciously upon the body of the dead dinosaur, only to be driven away by another animal, which all three men recognized instantly as that king of all prehistoric creatures, the saber-toothed tiger. This newcomer, a tawny beast towering fifteen feet high at the shoulder, had a mouth disproportionate even to his great size—a mouth armed with four great tiger-teeth more than three feet in length. He had barely begun his meal, however, when he was challenged by another nightmare, a something apparently half-way between a dinosaur and a crocodile. At the first note the tiger charged. Clawing, striking, rending each other with their terrible teeth, a veritable avalanche of blood-thirsty rage, the combatants stormed up and down the little island. But the fighters were rudely interrupted, and the earthly visitors discovered that in this primitive world it was not only animal life that was dangerous.

The great tree standing on the farther edge of the island suddenly bent over, lashing out like a snake and grasping both. It transfixed them with the terrible thorns, which were now seen to be armed with needle-points and to possess barbs like fish-hooks. It ripped at them with the long branches, which were veritable spears. The broad leaves, armed with revolting sucking disks, closed about the two animals, while the long, slender twigs, each of which was now seen to have an eye at its extremity, waved about, watching each movement of the captives from a safe distance.

If the struggle between the two animals had been awful, this was Titanic. The air was torn by the roars of the reptile, the screams of the great cat, and the shrieks of the tree. The very ground rocked with the ferocity of the conflict. There could be but one result—soon the tree, having absorbed the two gladiators, resumed its upright position in all its beauty.

The members of the little group stared at each other, sick at heart.

"This is NO place to start a copper-mine. I think we'd better beat it," remarked Seaton presently, wiping drops of perspiration from his forehead.

"I think so," acquiesced Crane. "We found air and Earth-like conditions here; we probably will elsewhere."

"Are you all right, Dottie?" asked Seaton.

"All right, Dicky," she replied, the color flowing back into her cheeks. "It scared me stiff, and I think I have a lot of white hairs right now, but I wouldn't have missed it for anything."

She paused an instant, and continued:

"Dick, there must be a queer streak of brutality in me, but would you mind blowing up that frightful tree? I wouldn't mind its nature if it were ugly—but look at it! It's so deceptively beautiful! You wouldn't think it had the disposition of a fiend, would you?"

A GENERAL laugh relieved the nervous tension, and Seaton stepped impulsively toward DuQuesne with his hand outstretched.

"You've squared your account, Blackie. Say the word and the war's all off."

DuQuesne ignored the hand and glanced coldly at the group of eager, friendly faces.

"Don't be sentimental," he remarked evenly as he turned away to his room. "Emotional scenes pain me. I gave my word to act as one of the party."

"Well, may I be kicked to death by little red spiders!" exclaimed Seaton, dumbfounded, as the other disappeared. "He ain't a man, he's a fish!"

"He's a machine. I always thought so, and now I know it," stated Margaret, and the others nodded agreement.

"Well, we'll sure pull his cork as soon as we get back!" snapped Seaton. "He asked for it, and we'll give him both barrels!"

"I know I acted the fool out there," Margaret apologized, flushing hotly and looking at Crane. "I don't know what made me act so stupid. I used to have a little nerve."

"You were a regular little brick, Peg," Seaton returned instantly. "Both you girls are all to the good—the right kind to have along in ticklish places."

Crane held out his steady hand and took Margaret's in a warm clasp.

"For a girl in your weakened condition you were wonderful. You have no reason to reproach yourself."

Tears filled the dark eyes, but were held back bravely as she held her head erect and returned the pressure of his hand.

"Just so you don't leave me behind next time," she returned lightly, and the last word concerning the incident had been said.

Seaton applied the power and soon they were approaching another planet, which was surrounded by a dense fog. Descending slowly, they found it to be a mass of boiling-hot steam and rank vapors, under enormous pressure.

The next planet they found to have a clear atmosphere, but the ground had a peculiar, barren look; and analysis of the gaseous envelope proved it to be composed almost entirely of chlorin. No life of an earthly type could be possible upon such a world, and a search for copper, even with the suits and helmets, would probably be fruitless if not impossible.

"Well," remarked Seaton as they were again in

space, "we've got enough copper to visit several more worlds—several more solar systems, if necessary. But there's a nice, hopeful-looking planet right in front of us. It may be the one we're looking for."

Arrived in the belt of atmosphere, they tested it as before, and found it satisfactory.

CHAPTER XII

The Mastery of Mind Over Matter

THEY descended rapidly, directly over a large and imposing city in the middle of a vast, level, beautifully-planted plain. While they were watching it, the city vanished and the plain was transformed into a heavily-timbered mountain summit, the valleys falling away upon all sides as far as the eye could reach.

"Well, I'll say that's SOME mirage!" exclaimed Seaton, rubbing his eyes in astonishment. "I've seen mirages before, but never anything like that. Wonder what this air's made of? But we'll land, anyway, if we finally have to swim!"

The ship landed gently upon the summit, the occupants half expecting to see the ground disappear before their eyes. Nothing happened, however, and they disembarked, finding walking somewhat difficult because of the great mass of the planet. Looking around, they could see no sign of life, but they *felt* a presence near them—a vast, invisible something.

Suddenly, out of the air in front of Seaton, a man materialized; a man identical with him in every feature and detail, even to the smudge of grease under one eye, the small wrinkles in his heavy blue serge suit, and the emblem of the American Chemical Society upon his watch-fob.

"Hello, folks," the stranger began in Seaton's characteristic careless speech. "I see you're surprised at my knowing your language. You're a very inferior race of animals—don't even understand telepathy, don't understand the luminiferous ether, or the relation between time and space. Your greatest things, such as the Skylark and your object-compass, are merely toys."

Changing instantly from Seaton's form to that of Dorothy, likewise a perfect imitation, the stranger continued without a break:

"Atoms and electrons and things, spinning and whirling in their dizzy little orbits. . . ." It broke off abruptly, continuing in the form of DuQuesne:

"Couldn't make myself clear as Miss Vaneman—not a scientific convolution in her foolish little brain. You are a freer type, DuQuesne, unhampered by foolish, soft fancies. But you are very clumsy, although working fairly well with your poor tools—Brookings and his organization, the Perkins Café and its clumsy wireless telephones. All of you are extremely low in the scale. Such animals have not been known in our universe for ten million years, which is as far back as I can remember. You have millions of years to go before you will amount to anything; before you will even rise above death and its attendant necessity, sex."

The strange being then assumed form after form with bewildering rapidity, while the spectators stared in dumb astonishment. In rapid succession it took on the likeness of each member of the party, of the vessel

itself, of the watch in Seaton's pocket—reappearing as Seaton.

"Well, bunch," it said in a matter-of-fact voice, "there's no mental exercise in you and you're such a low form of life that you're of no use on this planet; so I'll dematerialize you."

A PECULIAR light came into its eyes as they stared intently into Seaton's, and he felt his senses reel under the impact of an awful mental force, but he fought back with all his power and remained standing.

"What's this?" the stranger demanded in surprise. "This is the first time in history that mere matter—which is only a manifestation of mind—has ever refused to obey mind. There's a screw loose somewhere."

"I must reason this out," it continued analytically, changing instantaneously into Crane's likeness. "Ah! I am not a perfect reproduction. This is the first matter I have ever encountered that I could not reproduce perfectly. There is some subtle difference. The external form is the same, the organic structure likewise. The molecules of substance are arranged as they should be, as are also the atoms in the molecule. The electrons in the atom—ah! There is the difficulty. The arrangement and number of electrons, as well as positive charges, are entirely different from what I had supposed. I must derive the formula."

"Let's go, folks!" said Seaton hastily, drawing Dorothy back toward the Skylark. "This dematerialization stunt may be play for him, but I don't want any of it in my family."

"No, you really *must* stay," remonstrated the stranger. "Much as it is against my principles to employ brute force, you must stay and be properly dematerialized, alive or dead. Science demands it."

As he spoke, he started to draw his automatic pistol. Being in Crane's form, he drew slowly, as Crane did; and Seaton, with the dexterity of much sleight-of-hand work and of years of familiarity with his weapon, drew and fired in one incredibly rapid movement, before the other had withdrawn the pistol from his pocket. The X-plusive shell completely volatilized the stranger and hurled the party backward toward the Skylark, into which they fled hastily. As Crane, the last one to enter the vessel, fired his pistol and closed the massive door, Seaton leaped to the levers. As he did so, he saw a creature materialize in the air of the vessel and fall to the floor with a crash as he threw on the power. It was a frightful thing, like nothing ever before seen upon any world; with great teeth, long, sharp claws, and an automatic pistol clutched firmly in a human hand. Forced flat by the terrific acceleration of the vessel, it was unable to lift either itself or the weapon, and lay helpless.

"We take one trick, anyway!" blazed Seaton, as he threw on the power of the attractor and diffused its force into a screen over the party, so that the enemy could not materialize in the air above them and crush them by mere weight. "As pure mental force, you're entirely out of my class, but when you come down to matter, which I can understand, I'll give you a run for your money until my angles catch fire."

"That is a childish defiance. It speaks well for your courage, but ill for your intelligence," the animal said, and vanished.

A moment later Seaton's hair almost stood on end as he saw an automatic pistol appear upon the board directly in front of him, clamped to it by bands of steel. Paralyzed by this unlooked-for demonstration of the mastery of mind over matter, unable to move a muscle, he lay helpless, staring at the engine of death in front of him. Although the whole proceeding occupied only a fraction of a second, it seemed to Seaton as though he watched the weapon for hours. As the sleeve drew back, cocking the pistol and throwing a cartridge into the chamber, the trigger moved, and the hammer descended to speed on its way the bullet which was to blot out his life. There was a sharp click as the hammer fell—Seaton was surprised to find himself still alive until a voice spoke, apparently from the muzzle of the pistol, with the harsh sound of a metallic diaphragm.

"I was almost certain that it wouldn't explode," the stranger said, chattily. "You see, I haven't derived that formula yet, so I couldn't make a real explosive. I could of course, materialize beside you, under your protective screen, and crush you in a vise. I could materialize as a man of metal, able to stand up under this acceleration, and do you to death. I could even, by a sufficient expenditure of mental energy, materialize a planet around your ship and crush it. However, these crude methods are distasteful in the extreme, especially since you have already given me some slight and unexpected mental exercise. In return, I shall give you one chance for your lives. I cannot dematerialize either you or your vessel until I work out the formula for your peculiar atomic structure. If I can derive the formula before you reach the boundaries of my home-space, beyond which I cannot go, I shall let you go free. Deriving the formula will be a neat little problem. It should be fairly easy, as it involves only a simple integration in ninety-seven dimensions."

SILENCE ensued, and Seaton advanced his lever to the limit of his ability to retain consciousness. Almost overcome by the horror of their position, in an agony of suspense, expecting every instant to be hurled into nothingness, he battled on, with no thought of yielding, even in the face of those overwhelming mental odds.

"You can't do it, old top," he thought savagely, concentrating all the power of his highly-trained mind against the intellectual monster. "You can't dematerialize us, and you can't integrate above ninety-five dimensions to save your neck. You can't do it—you're slipping—you're all balled up right now!"

For more than an hour the silent battle raged, during which time the Skylark flew millions upon millions of miles toward Earth. Finally the stranger spoke again.

"You three win," it said abruptly. In answer to the unspoken surprise of all three men it went on: "Yes, all three of you got the same idea and Crane even forced his body to retain consciousness to fight me. Your efforts were very feeble, of course, but were

enough to interrupt my calculations at a delicate stage, every time. You are a low form of life, undoubtedly, but with more mentality than I supposed at first. I could get that formula, of course, in spite of you, if I had time, but we are rapidly approaching the limits of my territory, outside of which even I could not think my way back. That is one thing in which your mechanical devices are superior to anything my own race developed before we became pure intellectuals. They point the way back to your Earth, which is so far away that even my mentality cannot grasp the meaning of the distance. I can understand the Earth, can visualize it from your minds, but I cannot project myself any nearer to it than we are at present. Before I leave you, I will say that you have conferred a real favor upon me—you have given me something to think about for thousands of cycles to come. Good-bye."

Assured that their visitor had really gone, Seaton reduced the power to that of gravity and Dorothy soon sat up, Margaret reviving more slowly.

"Dick," said Dorothy solemnly, "did that happen or have I been unconscious and just had a nightmare?"

"It happened, all right," returned her lover, wiping his brow in relief. "See that pistol clamped upon the top of the board? That's a token in remembrance of him."

Dorothy, though she had been only half conscious, had heard the words of the stranger. As she looked at the faces of the men, white and drawn with the mental struggle, she realized what they had gone through, and she drew Seaton down into one of the seats, stroking his hair tenderly.

Margaret went to her room immediately, and as she did not return, Dorothy followed. She came back presently with a look of concern upon her face.

"This life is a little hard on Peggy. I didn't realize how much harder for her it would be than it is for me until I went in there and found her crying. It is much harder for her, of course, since I am with you, Dick, and with you, Martin, whom I know so well. She must feel terribly alone."

"Why should she?" demanded Seaton. "We think she's some game little guy. Why, she's one of the bunch! She must know that!"

"Well, it isn't the same," insisted Dorothy. "You be extra nice to her, Dick. But don't you dare let her know I told you about the tears, or she'd eat me alive!"

Crane said nothing—a not unusual occurrence—but his face grew thoughtful and his manner, when Margaret appeared at mealtime, was more solicitous than usual and more than brotherly in its tenderness.

"I shall be an interstellar diplomat," Dorothy whispered to Seaton as soon as they were alone. "Wasn't that a beautiful bee I put upon Martin?"

Seaton stared at her a moment, then shook her gently before he took her into his arms.

THE information, however, did not prevent him from calling to Crane a few minutes later, even though he was still deep in conversation with Margaret. Dorothy gave him an exasperated glance and walked away.

"I sure pulled a boner that time," Seaton muttered

as he plucked at his hair ruefully. "It nearly did us. 'Let's test this stuff out and see if it's X, Mart, while DuQuesne's out of the way. If it is X, it's SOME find!'"

Seaton cut off a bit of metal with his knife, hammered it into a small piece of copper, and threw the copper into the power-chamber, out of contact with the plating. As the metal received the current the vessel started slightly.

"It is X! Mart, we've got enough of this stuff to supply three worlds!"

"Better put it away somewhere," suggested Crane, and after the metal had been removed to Seaton's cabin, the two men again sought a landing-place. Almost in their line of flight they saw a close cluster of stars, each emitting a peculiar greenish light which, in the spectro-scope, revealed a blaze of copper lines.

"That's our meat, Martin. We ought to be able to grab some copper in that system, where there's so much of it that it colors their sunlight."

"The copper is undoubtedly there, but it might be too dangerous to get so close to so many suns. We may have trouble getting away."

"Well, our copper's getting horribly low. We've got to find some pretty quick, somewhere, or else walk back home, and there's our best chance. We'll feel our way along. If it gets too strong, we'll beat it."

When they had approached so close that the suns were great stars widely spaced in the heavens, Crane relinquished the controls to Seaton.

"If you will take the lever awhile, Dick, Margaret and I will go downstairs and see if we can locate a planet."

After a glance through the telescope, Crane knew that they were still too far from the group of suns to place any planet with certainty, and began taking notes. His mind was not upon his work, however, but was completely filled with thoughts of the girl at his side. The intervals between his comments became longer and longer until they were standing in silence, both staring with unseeing eyes out into the trackless void. But it was in no sense their usual companionable silence. Crane was fighting back the words he longed to say. This lovely girl was not here of her own accord—she had been torn forcibly from her home and from her friends, and he would not, could not, make her already difficult position even more unpleasant by forcing his attentions upon her. Margaret sensed something unusual and significant in his attitude and held herself tense, her heart beating wildly.

At that moment an asteroid came within range of the Skylark's watchful repeller, and at the lurch of the vessel, as it swung around the obstruction, Margaret would have fallen had not Crane instinctively caught her with one arm. Ordinarily this bit of courtesy would have gone unnoticed by both, as it had happened many times before, but in that heavily-charged atmosphere it took on a new significance. Both blushed hotly, and as their eyes met each saw that which held them spell-bound. Slowly, almost as if without volition, Crane put his other arm around her. A wave of deeper crimson swept over her face and she bent her handsome head as her slender body yielded to his arms with no

effort to free itself. Finally Crane spoke, his usually even voice faltering.

"Margaret, I hope you will not think this unfair of me . . . but we have been through so much together that I feel as though we had known each other forever. Until we went through this last experience I had intended to wait—but why should we wait? Life is not lived in years alone, and you know how much I love you, my dearest!" he finished, passionately.

Her arms crept up around his neck, her bowed head lifted, and her eyes looked deep into his as she whispered her answer:

"I think I do . . . Oh, Martin!"

Presently they made their way back to the engine-room, keeping the singing joy in their hearts inaudible and the kisses fresh upon their lips invisible. They might have kept their secret for a time, had not Seaton promptly asked:

"Well, what did you find, Mart?"

A panicky look appeared upon Crane's self-possessed countenance and Margaret's fair face glowed like a peony.

"Yes, what *did* you find?" demanded Dorothy, as she noticed their confusion.

"My future wife," Crane answered steadily.

The two girls rushed into each other's arms and the two men silently gripped hands in a clasp of steel; for each of the four knew that these two unions were not passing fancies, lightly entered into and as lightly cast aside, but were true partnerships which would endure throughout the entire span of life.

A PLANET was located and the Skylark flew toward it. Discovering that it was apparently situated in the center of the cluster of suns, they hesitated; but finding that there was no dangerous force present, they kept on. As they drew nearer, so that the planet appeared as a very small moon, they saw that the Skylark was in a blaze of green light, and looking out of the windows, Crane counted seventeen great suns, scattered in all directions in the sky! Slowing down abruptly as the planet was approached, Seaton dropped the vessel slowly through the atmosphere, while Crane and DuQuesne tested and analyzed it.

"Pressure, thirty pounds per square inch. Surface gravity as compared to that of the Earth, two-fifths. Air-pressure about double that of the Earth, while a fine-pound weight weighs only two pounds. A peculiar combination," reported Crane, and DuQuesne added:

"Analysis about the same as our air except for two and three-tenths per cent of a gas that isn't poisonous and which has a peculiar, fragrant odor. I can't analyze it and think it probably an element unknown upon Earth, or at least very rare."

"It would have to be rare if you don't know what it is," acknowledged Seaton, locking the Skylark in place and going over to smell the strange gas.

Deciding that the air was satisfactory, the pressure inside the vessel was slowly raised to the value of that outside and two doors were opened, to allow the new atmosphere free circulation.

Seaton shut off the power actuating the repeller and let the vessel settle slowly toward the ocean which was

directly beneath them—an ocean of a deep, intense, wondrously beautiful blue, which the scientists studied with interest. Arrived at the surface, Seaton moistened a rod in a wave, and tasted it cautiously, then uttered a yell of joy—a yell broken off abruptly as he heard the sound of his own voice. Both girls started as the vibrations set up in the dense air smote upon their eardrums. Seaton moderated his voice and continued:

"I forgot about the air-pressure. But hurrah for this ocean—a get's ammoniacal copper sulphate solution! We can sure get all the copper we want, right here, but it would take weeks to evaporate the water and recover the metal. We can probably get it easier ashore. Let's go!"

They started off just above the surface of the ocean toward the nearest continent, which they had observed from the air.

CHAPTER XIII

Nalboon of Mardonale

AS the Skylark approached the shore, its occupants heard a rapid succession of heavy detonations, apparently coming from the direction in which they were traveling.

"Wonder what that racket is?" asked Seaton.

"It sounds like big guns," said Crane, and DuQuesne nodded agreement.

"Big guns is right. They're shooting high explosive shells, too, or I never heard any. Even allowing for the density of the air, that kind of noise isn't made by pop-guns."

"Let's go see what's doing," and Seaton started to walk toward one of the windows with his free, swinging stride. Instantly he was a-sprawl, the effort necessary to carry his weight upon the Earth's surface lifting him into the air in a succession of ludicrous hops, but he soon recovered himself and walked normally.

"I forgot this two-fifths gravity stuff," he laughed. "Walk as though we had only a notch of power on and it goes all right. It sure is funny to feel so light when we're so close to the ground."

He closed the doors to keep out a part of the noise and advanced the speed lever a little, so that the vessel tilted sharply under the pull of the almost horizontal bar.

"Go easy," cautioned Crane. "We do not want to get in the way of one of their shells. They may be of a different kind than those we are familiar with."

"Right—easy it is. We'll stay forty miles above them, if necessary."

As the great speed of the ship rapidly lessened the distance, the sound grew heavier and clearer—like one continuous explosion. So closely did one deafening concussion follow another that the ear could not distinguish the separate reports.

"I see them," simultaneously announced Crane, who was seated at one of the forward windows searching the country with his binoculars, and Seaton, who, from the pilot's seat, could see in any direction.

The others hurried to the windows with their glasses and saw an astonishing sight.

"Aerial battleships, eight of 'em!" exclaimed Seaton,

"as big as the Idaho. Four of 'em are about the same shape as our battleships. No wings—they act like helicopters."

"Four of them are battleships, right enough, but what about the other four?" asked DuQuesne. "They are not ships or planes or anything else that I ever heard of."

"They are animals," asserted Crane. "Machines never were and never will be built like that."

As the Skylark cautiously approached, it was evident to the watchers that four of the contestants were undoubtedly animals. Here indeed was a new kind of animal, an animal able to fight on even terms with a first-class battleship! Frightful aerial monsters they were. Each had an enormous, torpedo-shaped body, with scores of prodigiously long tentacles like those of a devil-fish and a dozen or more great, soaring wings. Even at that distance they could see the row of protruding eyes along the side of each monstrous body and the terrible, prow-like beaks tearing through the metal of the warships opposing them. They could see, by the reflection of the light from the many suns, that each monster was apparently covered by scales and joints of some transparent armor. That it was real and highly effective armor there could be no doubt, for each battleship bristled with guns of heavy caliber and each gun was vomiting forth a continuous stream of fire. Shells bursting against each of the creatures made one continuous blaze, and the uproar was indescribable—an uninterrupted cataclysm of sound appalling in its intensity.

THE battle was brief. Soon all four of the battleships had crumpled to the ground, their crews absorbed by the terrible sucking arms or devoured by the frightful beaks. They did not die in vain—three of the monsters had been blown to atoms by shells which had apparently penetrated their armor. The fourth was pursuing something, which Seaton now saw was a fleet of small airships, which had flown away from the scene of conflict. Swift as they were, the monster covered three feet to their one.

"We can't stand for anything like that," cried Seaton, as he threw on the power and the Skylark leaped ahead. "Get ready to bump him off, Mart, when I jerk him away. He acts hard-boiled, so give him a real one—fifty milligrams!"

Sweeping on with awful speed the monster seized the largest and most gaily decorated plane in his hundred-foot tentacles just as the Skylark came within sighting distance. In four practically simultaneous movements Seaton sighted the attractor at the ugly beak, released all its power, pointed the main bar of the Skylark directly upward, and advanced his speed lever. There was a crash of rending metal as the thing was torn loose from the plane and jerked a hundred miles into the air, struggling so savagely in that invisible and incomprehensible grip that the three-thousand-ton mass of the Skylark tossed and pitched like a child's plaything. Those inside her heard the sharp, spiteful crack of the machine-gun, and an instant later they heard a report that paralyzed their senses, even inside the vessel and in the thin air of their enormous elevation, as the largest X-plusive bullet prepared by the inventors struck full

upon the side of the hideous body. There was no smoke, no gas or vapor of any kind—only a huge volume of intolerable flame as the energy stored within the atoms of copper, instantaneously liberated, heated to incandescence and beyond all the atmosphere within a radius of hundreds of feet. The monster disappeared utterly, and Seaton, with unerring hand, reversed the bar and darted back down toward the fleet of airships. He reached them in time to focus the attractor upon the wrecked and helpless plane in the middle of its five-thousand-foot fall and lowered it gently to the ground, surrounded by the fleet.

The Skylark landed easily beside the wrecked machine, and the wanderers saw that their vessel was completely surrounded by a crowd of people—men and women identical in form and feature with themselves. They were a superbly molded race, the men fully as large as Seaton and DuQuesne; the women, while smaller than the men, were noticeably taller than the two women in the car. The men wore broad collars of metal, numerous metallic ornaments, and heavily-jeweled leather belts and shoulder-straps which were hung with weapons of peculiar patterns. The women carried no weapons, but were even more highly decorated than were the men—each slender, perfectly-formed body scintillated with the brilliance of hundreds of strange gems, flashing points of fire. Jeweled bands of metal and leather restrained their carefully-groomed hair; jeweled collars encircled their throats; jeweled belts, jeweled bracelets, jeweled anklets, each added its quota of brilliance to the glittering whole. The strangers wore no clothing, and their smooth skins shone a dark, livid, utterly indescribable color in the peculiar, unearthly, yellowish-bluish-green glare of the light. Green their skins undoubtedly were, but not any shade of green visible in the Earthly spectrum. The "whites" of their eyes were a light yellowish-green. The heavy hair of the women and the close-cropped locks of the men were green as well—a green so dark as to be almost black, as were also their eyes.

"Well, what d'you know about that?" pondered Seaton, dazedly. "They're human, right enough, but ye gods, what a color!"

"It is hard to tell how much of that color is real, and how much of it is due to this light," answered Crane. "Wait until you get outside, away from our daylight lamps, and you will probably look like a Chinese puzzle. As to the form, it is logical to suppose that wherever conditions are similar to those upon the Earth, and the age is anywhere nearly the same, development would be along the same lines as with us."

"That's right, too. Dottie, your hair will sure look gorgeous in this light. Let's go out and give the natives a treat!"

"I wouldn't look like that for a million dollars!" retorted Dorothy, "and if I'm going to look like that I won't get out of the ship, so there!"

"Cheer up, Dottie, you won't look like that. Your hair will be black in this light."

"Then what color will mine be?" asked Margaret.

Seaton glanced at her black hair.

"Probably a very dark and beautiful green," he grinned, his gray eyes sparkling, "but we'll have to wait

and see. Friends and fellow-countrymen, I've got a hunch that this is going to be SOME visit. How about it, shall we go ahead with it?"

Dorothy went up to him, her face bright with eagerness.

"Oh, what a lark! Let's go!"

EVEN in DuQuesne's cold presence, Margaret's eyes sought those of her lover, and his sleeve, barely touching her arm, was enough to send a dancing thrill along it.

"Onward, men of Earth!" she cried, and Seaton, stepping up to the window, rapped sharply upon the glass with the butt of his pistol and raised both hands high above his head in the universal sign of peace. In response, a man of Herculean mold, so splendidly decorated that his harness was one blazing mass of jewels, waved his arm and shouted a command. The crowd promptly fell back, leaving a clear space of several hundred yards. The man, evidently one in high command, unbuckled his harness, dropping every weapon, and advanced toward the Skylark, both arms upraised in Seaton's gesture.

Seaton went to the door and started to open it.

"Better talk to him from inside," cautioned Crane.

"I don't think so, Mart. He's peaceable, and I've got my gun in my pocket. Since he doesn't know what clothes are he'll think I'm unarmed, which is as it should be; and if he shows fight, it won't take more than a week for me to get into action."

"All right, go on. DuQuesne and I will come along."

"Absolutely not. He's alone, so I've got to be. I notice that some of his men are covering us, though. You might do the same for them, with a couple of the machine guns."

Seaton stepped out of the car and went to meet the stranger. When they had approached to within a few feet of each other the stranger stopped. He flexed his left arm smartly, so that the finger-tips touched his left ear, and smiled broadly, exposing a row of splendid, slining, green teeth. Then he spoke, a meaningless jumble of sounds. His voice, though light and thin, nevertheless seemed to be of powerful timbre.

Seaton smiled in return and saluted.

"Hello, Chief. I get your idea all right, and we're glad you're peaceable, but your language doesn't mean a thing in my young life."

The Chief tapped himself upon the chest, saying distinctly and impressively:

"Nalboon."

"Nalboon," repeated Seaton, and added, pointing to himself:

"Seaton."

"See Tin," answered the stranger, and again indicating himself, "Domak gok Mardonale."

"That must be his title," thought Seaton rapidly. "Have to give myself one, I guess."

"Boss of the Road," he replied, drawing himself up with pride.

The introduction made, Nalboon pointed to the wrecked plane, inclined his head in thanks, and turned to his people with one arm upraised, shouting an order in which Seaton could distinguish something that

sounded like "See Tin, Bass uvvy Rood." Instantly every right arm in the assemblage was aloft, that of each man bearing a weapon, while the left arms snapped into the peculiar salute and a mighty cry arose as all repeated the name and title of the distinguished visitor.

Seaton turned to the Skylark, motioning to Crane to open the door.

"Bring out one of those big four-color signal rockets, Mart!" he called. "They're giving us a royal reception—let's acknowledge it right."

THE party appeared, Crane carrying the huge rocket with an air of deference. As they approached, Seaton shrugged one shoulder and his cigarette-case appeared in his hand. Nalboon started, and in spite of his utmost efforts at self-control, he glanced at it in surprise. The case flew open and Seaton, taking a cigarette, extended the case.

"Smoke?" he asked affably. The other took one, but showed plainly that he had no idea of the use to which it was to be put. This astonishment of the stranger at a simple sleight-of-hand feat and his apparent ignorance of tobacco emboldened Seaton. Reaching into his mouth, he pulled out a flaming match, at which Nalboon started violently. While all the natives watched in amazement, Seaton lighted the cigarette, and after half consuming it in two long inhalations, he apparently swallowed the remainder, only to bring it to light again. Having smoked it, he apparently swallowed the butt, with evident relish.

"They don't know anything about matches or smoking," he said, turning to Crane. "This rocket will tie them up in a knot. Step back, everybody."

He bowed deeply to Nalboon, pulling a lighted match for his ear as he did so, and lighted the fuse. There was a roar, a shower of sparks, a blaze of colored fire as the great rocket flew upward; but to Seaton's surprise, Nalboon took it quite as a matter of course, saluting as an acknowledgment of the courtesy.

Seaton motioned to his party to approach, and turned to Crane.

"Better not, Dick. Let him think that you are the king of everything in sight."

"Not on your life. If he is one king, we are two," and he introduced Crane, with great ceremony, to the Domak as the "Boss of the Skylark," at which the salute by his people was repeated.

Nalboon then shouted an order and a company of soldiers led by an officer came toward them, surrounding a small group of people, apparently prisoners. These captives, seven men and seven women, were much lighter in color than the rest of the gathering, having skins of a ghastly, pale shade, practically the same color as the whites of their eyes. In their bodily aspects they were the same as their captors in appearance, save that they were entirely naked except for the jeweled metal collars worn by all and a massive metal belt worn by one man. They walked with a proud and lofty carriage, scorn for their captors in every step.

Nalboon barked an order to the prisoners. They stared in defiance, motionless, until the man wearing the belt, who had studied Seaton closely, spoke a few words in a low tone, when they all prostrated them-

selves. Naloon then waved his hand, giving the whole group to Seaton as slaves. Seaton, with no sign of his surprise, thanked the giver and motioned his slaves to rise. They obeyed and placed themselves behind the party—two men and two women behind Seaton and the same number behind Crane; one man and one woman behind each of the others.

Seaton then tried to make Naloon understand that they wanted copper, pointing to his anklet, the only copper in sight. The chief instantly removed the trinket and handed it to Seaton; who, knowing by the gasp of surprise of the guard that it was some powerful symbol, returned it with profuse apologies. After trying in vain to make the other understand what he wanted, he led him into the Skylark and showed him the remnant of the power-bar. He showed him its original size and indicated the desired number by counting to sixteen upon his fingers. Naloon nodded his comprehension and going outside, pointed upward toward the largest of the eleven suns visible, motioning its rising and setting, four times.

He then invited the visitors, in unmistakable sign language, to accompany him as guests of honor, but Seaton refused.

"Lead on, MacDuff, we follow," he replied, explaining his meaning by signs as they turned to enter the vessel. The slaves followed closely until Crane remonstrated.

"We don't want them aboard, do we, Dick? There are too many of them."

"All right," Seaton replied, and waved them away. As they stepped back the guard seized the nearest, a woman, and forced her to her knees; while a man, adorned with a necklace of green human teeth and carrying a shining broadsword, prepared to decapitate her.

"We must take them with us, I see," said Crane, as he brushed the guards aside. Followed by the slaves, the party entered the Skylark, and the dark green people embarked in their airplanes and helicopters.

Naloon rode in a large and gaily-decorated plane, which led the fleet at its full speed of six hundred miles an hour, the Skylark taking a placing a few hundred yards above the flagship.

"I don't get these folks at all, Mart," said Seaton, after a moment's silence. "They have machines far ahead of anything we have on Earth and big guns that shoot as fast as machine-guns, and yet are scared to death at a little simple sleight-of-hand. They don't seem to understand matches at all, and yet treat fireworks as an every-day occurrence."

"We will have to wait until we know them better," replied Crane, and DuQuesne added:

"From what I have seen, their power seems to be all electrical. Perhaps they aren't up with us in chemistry, even though they are ahead of us in mechanics?"

FLYING above a broad, but rapid and turbulent stream, the fleet soon neared a large city, and the visitors from Earth gazed with interest at this metropolis of the unknown world. The buildings were all the same height, flat-roofed, and arranged in squares very much as our cities are arranged. There were no streets,

the spaces between the buildings being park-like areas, evidently laid out for recreation, amusement, and sport. There was no need for streets; all traffic was in the air. The air seemed full of flying vehicles, darting in all directions, but it was soon evident that there was exact order in the apparent confusion, each class of vessel and each direction of traffic having its own level. Eagerly the three men studied the craft, which ranged in size from one-man helicopters, little more than single chairs flying about in the air, up to tremendous multiplane freighters, capable of carrying thousands of tons.

Flying high over the city to avoid its congested air-lanes, the fleet descended toward an immense building just outside the city proper, and all landed upon its roof save the flagship, which led the Skylark to a landing-dock nearby—a massive pile of metal and stone, upon which Naloon and his retinue stood to welcome the guests. After Seaton had anchored the vessel immovably by means of the attractor, the party disembarked, Seaton remarking with a grin:

"Don't be surprised at anything I do, folks. I'm a walking storehouse of junk of all kinds, so that if occasion arises I can put on a real exhibition."

As they turned toward their host, a soldier, in his eagerness to see the strangers, jostled another. Without a word two keen swords flew from their scabbards and a duel to the death ensued. The visitors stared in amazement, but no one else paid any attention to the combat, which was soon over; the victor turning away from the body of his opponent and resuming his pace without creating a ripple of interest.

Naloon led the way into an elevator, which dropped rapidly to the ground-floor level. Massive gates were thrown open, and through ranks of people prostrate upon their faces the party went out into the palace grounds of the Domak, or Emperor, of the great nation of Mardonale.

Never before had Earthly eyes rested upon such scenes of splendor. Every color and gradation of their peculiar spectrum was present, in solid, liquid, and gas. The carefully-tended trees were all colors of the rainbow, as were the grasses and flowers along the walks. The fountains played streams of many and constantly-changing hues, and even the air was tinted and perfumed, swirling through metal arches in billows of ever-varying colors and scents. Colors and combinations of colors impossible to describe were upon every hand, fantastically beautiful in that peculiar, livid light. Diamonds and rubies, their colors so distorted by the green radiance as to be almost unrecognizable; emeralds glowing with an intense green impossible in earthly light, together with strange gems peculiar to this strange world, sparkled and flashed from railings, statues, and pedestals throughout the ground.

"Isn't this gorgeous, Dick?" whispered Dorothy. "But what do I look like? I wish I had a mirror—you look simply awful. Do I look like you do?"

"Not being able to see myself, I can't say, but I imagine you do. You look as you would under a county-fair photographer's mercury-vapor arc lamps, only worse. The colors can't be described. You might as well try to describe cerise to a man born blind as to

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try to express these colors in English, but as near as I can come to it, your eyes are a dark sort of purplish green, with the whites of your eyes and your teeth a kind of plush green. Your skin is a pale yellowish green, except for the pink of your cheeks, which is a kind of black, with orange and green mixed up in it. Your lips are black, and your hair is a funny kind of color, halfway between black and old rose, with a little green and . . ."

"Heavens, Dick, stop! That's enough!" choked Dorothy. "We all look like hobgoblins. We're even worse than the natives."

"Sure we are. They were born here and are acclimated to it—we are strangers and aren't. I would like to see what one of these people would look like in Washington."

NALBOON led them into the palace proper and into a great dining hall, where a table was already prepared for the entire party. This room was splendidly decorated with jewels, its many windows being simply masses of gems. The walls were hung with a cloth resembling silk, which fell to the floor in shimmering waves of color.

Woodwork there was none. Doors, panels, tables, and chairs were cunningly wrought of various metals. Seaton and DuQuesne could recognize a few of them, but for the most part they were unknown upon the Earth; and were, like the jewels and vegetation of this strange world, of many and various peculiar colors. A closer inspection of one of the marvelous tapestries showed that it also was of metal, its threads numbering thousands to the inch. Woven of many different metals, of vivid but harmonious colors in a strange and intricate design, it seemed to writhe as its colors changed with every variation in the color of the light; which, pouring from concealed sources, was reflected by the highly-polished metal and innumerable jewels of the lofty, domed ceiling.

"Oh . . . isn't this too perfectly gorgeous?" breathed Dorothy. "I'd give anything for a dress made out of that stuff, Dick. Cloth-of-gold is common by comparison!"

"Would you dare wear it, Dottie?" asked Margaret.

"*Would I?* I'd wear it in a minute if I could only get it. It would take Washington by storm!"

"I'll try to get a piece of it, then," smiled Seaton. "I'll see about it while we are getting the copper."

"We'd better be careful in choosing what we eat here, Seaton," suggested DuQuesne, as the Domak himself led them to the table.

"We sure had. With a copper ocean and green teeth, I shouldn't be surprised if copper, arsenic, and other such trifles formed a regular part of their diet."

"The girls and I will wait for you two chemists to approve every dish before we try it, then," said Crane.

Nalboon placed his guests, the light-skinned slaves standing at attention behind them, and numerous servants, carrying great trays, appeared. The servants were intermediate in color between the light and the dark races, with dull, unintelligent faces, but quick and deft in their movements.

The first course—a thin, light wine, served in metal

goblets—was approved by the chemists, and the dinner was brought on. There were mighty joints of various kinds of meat; birds and fish, both raw and cooked in many ways; green, pink, purple, and white vegetables and fruits. The majordomo held each dish up to Seaton for inspection, the latter waving away the fish and the darkest green foods, but approving the others. Heaping plates, or rather metal trays, of food were placed before the diners, and the attendants behind their chairs handed them peculiar implements—knives with razor edges, needle-pointed stilettoes instead of forks, and wide, flexible spatulas, which evidently were to serve the purposes of both forks and spoons.

"I simply can't eat with these things!" exclaimed Dorothy in dismay, "and I don't like to drink soup out of a can, so there!"

"That's where my lumberjack training comes in handy," grinned Seaton. "With this spatula I can eat faster than I could with two forks. What do you want, girls, forks or spoons, or both?"

"Both, please."

Seaton reached out over the table, seizing forks and spoons from the air and passing them to the others, while the natives stared in surprise. The Domak took a bowl filled with brilliant blue crystals from the majordomo, sprinkled his food liberally with the substance, and passed it to Seaton, who looked at the crystals attentively.

"Copper sulphate," he said to Crane. "It's a good thing they add it at the table instead of cooking with it, or we'd be out of luck."

Waving the copper sulphate away, he again reached out, this time producing a pair of small salt- and pepper-shakers, which he passed to the Domak after he had seasoned the dishes before him. Nalboon tasted the pepper cautiously and smiled in delight, half-emptying the shaker upon his plate. He then sprinkled a few grains of salt into his palm, stared at them with an expression of doubting amazement, and after a few rapid sentences poured them into a dish held by an officer who had sprung to his side. The officer studied them closely, then carefully washed his chief's hand. Nalboon turned to Seaton, plainly asking for the salt-cellar.

"Sure, old top. Keep 'em both, there's lots more where those came from," as he produced several more sets in the same mysterious way and handed them to Crane, who in turn passed them to the others.

THE meal progressed merrily, with much conversation in the sign-language between the two parties. It was evident that Nalboon, usually stern and reticent, was in an unusually pleasant mood. The viands, though of peculiar flavor, were in the main pleasing to the palates of the Earthly visitors.

"This fruit salad, or whatever it is, is divine," remarked Dorothy, after an experimental bite. "May we eat as much as we like, or had we better just eat a little?"

"Go as far as you like," returned her lover. "I wouldn't recommend it as a steady diet, as I imagine everything contains copper and other heavy metals in noticeable amounts, and probably considerable arsenic,

but for a few days it can't very well hurt us much."

After the meal, Nalobon bade them a ceremonious farewell, and they were escorted to a series of five connecting rooms by the royal usher, escorted by an entire company of soldiers, who mounted guard outside the doors. Gathered in one room, they discussed sleeping arrangements. The girls insisted that they would sleep together, and that the men should occupy the rooms at either side. As the girls turned away, the four slaves followed.

"We don't want these people, and I can't make them go away!" cried Dorothy.

"I don't want them, either," replied Seaton, but if we chase them out they'll get their heads chopped off. You girls take the women and we'll take the men."

Seaton waved all the women into the girls' room, but they paused irresolutely. One of them went up to the man wearing the metal belt, evidently their leader, and spoke to him rapidly as she threw her arms around his neck. He shook his head, motioning toward Seaton several times as he spoke to her reassuringly. With his arm about her tenderly, he led her to the door, the other women following. Crane and DuQuene having gone to their rooms with their attendants, the man wearing the belt drew the blinds and turned to assist Seaton in taking off his clothes.

"I never had a valet before, but go as far as you like if it pleases you," remarked Seaton, as he began to throw off his clothes. A multitude of small articles fell from their hiding-places in his garments as he re-

moved them. Almost stripped, Seaton stretched vigorously, the muscles writhing and rippling in great ridges under the satin skin of his broad back and mighty arms and shoulders as he filled his capacious lungs and twisted about, working off the stiffness caused by the days of comparative confinement.

The four slaves stared in open-mouthed astonishment at this display of muscular development and conversed among themselves as they gathered up Seaton's discarded clothing. Their leader picked up a salt-shaker, a couple of silver knives and forks, and some other articles, and turned to Seaton, apparently asking permission to do something with them. Seaton nodded assent carelessly and turned to his bed. As he did so, he heard a slight clank of arms in the hall as the guard was changed, and lifting the blind a trifle he saw that guards were stationed outside as well. As he went to bed, he wondered whether the guards were guards of honor or jailers; whether he and his party were honored guests or prisoners.

Three of the slaves, at a word from their chief, threw themselves upon the floor and slept, but he himself did not rest. Opening the apparently solid metal belt, he took out a great number of small tools, many tiny instruments, and several spools of insulated wire. He then took the articles Seaton had given him, taking great pains not to spill a single grain of salt, and set to work. Hour after hour he labored, a strange, exceedingly complex instrument taking form under his clever fingers.

END OF PART II



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.

BRICKBATS AT LAST

Editor, AMAZING STORIES:

There were never so many mistakes in AMAZING STORIES monthly as in the June issue. The editing and proofreading of your scientific magazine is simply heroic, misprints on every page, bad grammar and worse of all, the most ridiculous contributions, for instance, on page 245, in the fourth paragraph, "Although it means it revolves in the same direction as Mars and the rest of the planets, namely, from west to east, on account of its greater speed it appears as if were moving from west to east."

Page 245, again—"(for this and other reasons)—we find that light and heat are practically the same on the two planets (Mars and Earth) with several points, etc."

"Now turn to page 252—"and for that reason the nights on Mars are extremely cold. This is true of the temperate, etc."

Page 245—"A great deal more heat is absorbed, and retained on Mars than on earth."

Page 247—"Naturally such a thin blanket of air (speaking of Mars) cannot retain the solar heat."

The other articles are full of such nonsense. You must admit that the editing of your AMAZING STORIES is very deficient, and the proofreader likewise.

Geo. Sawares,

189 Foye Street, Bronx, N. Y. City.

[This is the first letter that reached us, where complaint is made that the proofreading for the magazine is "simply heroic," and that there are misprints on every page. We were not aware of this, and wish our correspondent would send us a copy marked up with such mistakes. We shall gladly pay him for his trouble.

As to the other remarks which our correspondent

refers to, i. e., page 245, 250, and 249; these statements as to the rotation of the moon-satellites of Mars are correct. We refer our correspondent to any text book on astronomy, and if he will reflect a little bit, he will find that the statements must be correct, strange as they sound.

Regarding the other quotations, there seems to be, to us, nothing wrong with them. The author simply wanted to point out that although Mars is much further removed from the sun than is the earth, still, astronomers today believe that the mean temperature of the two planets does not vary very much. On the earth, where we have a very thick atmosphere, we also have many clouds, which are non-existent on Mars. These clouds reflect and intercept a good deal of the solar-radiation, and if this were not so, the earth would be a great deal hotter than it actually is. Then again, the thick atmosphere of the earth, while it retains the heat being thus lost to the Martian atmosphere, does not allow so much of the solar radiation to strike the surface of the earth, because the atmosphere absorbs much of this heat. The difference between the two planets is, that on Mars the sun heats up the surface directly; while on earth the process is indirect, to a greater degree, because the surface is heated largely by the atmosphere. Any treatise on physics will show that where light passes through a thick medium (in this case the atmosphere), a great deal of the energy is absorbed. That is the case on earth. We therefore find that the Martian days are probably a lot hotter than those on earth, but the Martian nights are probably much cooler than those on earth, because Mars, having no protecting atmosphere, radiates the accumulated heat of the surface out into space quickly during the night. Our correspondent should distinguish between mean temperature, surface-temperatures and atmospheric temperatures.—EDITOR.]

THE QUESTIONNAIRE—OUR ARTISTS AND A SUGGESTION

Editor, AMAZING STORIES:

I am an old "friend" of the publication, AMAZING STORIES, having read it since its debut. I not only read the first numbers, but have them all on file, with an index by authors' names too.

I do not like the majority of the short stories, as I do not agree with Prof. Hatch that it is "impossible to work out adequately . . ." the implications contained in a new situation.

The questionnaire is all right, but the questions might be better chosen.

Absolutely, we want more illustrations. At least one to every two pages. Paul is a fine artist, but I think that he might divide the cover with one of the others occasionally. You might pair artists same as that of the story. By the way, your new name as that of the story, is very fine, and his picture for *A Story of the Days to Come* was a masterpiece, even if a little too futuristic for H. C. Wells.

HOWARD CAMPBELL,

8740 S. Wood St., Chicago, Illinois.

[As regards the length of stories, we feel that we should give more than two or three stories in an issue, and are glad to have some short ones to put in, for, we find the tendency of authors is to give long rather than short texts. We realize our own imperfections and know that the questionnaire might be better, but for its length, it is the most difficult article; if we may so term it, in the magazine. It interests us very much to get such intelligent criticism of our artists' work as you give. We will see that Mr. Lawlor is informed of your appreciation of his work.—EDITOR.]

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—Morlais Couzens.

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—A. G. Delwarto.

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—E. H. Lasater.

"Your training has opened things to me that otherwise I would probably be years in acquiring. I now enjoy comforts that before I had to do without. It enabled me to have a wonderful little home, a fine laboratory of my own, and gave me a respected position in one of the foremost textile concerns in the country."
—J. J. Kelly.

"If it weren't for your course I wouldn't have the job I've got now."
—George Daynes.

"Since beginning your course of study I have received an increase in my pay check, and as I progress my work, becomes lighter through a better understanding."
—M. C. Cole.

"I am mighty glad I took this course. My salary has been increased several times, and different industrial plants are coming to me for a little advice on different things, netting me a fair side income."
—M. E. Van Sickle.

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NAME.....
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(Continued from page 559)

[Regarding Mr. Gernsback's editorial, "Amazing Thinking," the correspondent would like to know where Mr. Gernsback got his information, and authority as to the ants' "very high order of thinking" and relatively high order of reasoning.]

While a large number of works could be mentioned which Mr. Gernsback uses constantly, as references on ants, the two following books probably give our correspondent excellent insight into ants, and their civilization:

The Ant People by Franz Evers
The Life of the White Ant by Maurice Maeterlinck.

Each of these books are written in popular vein, and can be easily understood by anyone.

There is no question, today, that the ants do think, and think very well at that.—EDITOR.]

APPRECIATION AND CRITICISM FROM A YOUNG READER

Editor, AMAZING STORIES:

I have been an interested reader of your magazine since its publication. The *EXPERIMENTAL* was a fine magazine and the science fiction which came in it, as well as in *SCIENCE AND INVENTION* and *RADIO NEWS* was fine. I have always enjoyed your editorials and I hope you will continue to do so.

I am only 14; in September I will be a Junior in high school. In my class *AMAZING STORIES* has received severe comment. I uphold the magazine and can always quiet a scoffer by asking him "What possibilities" in it. I have done this by showing that the story under comment is written by some famous author. As for criticisms, I receive only "What? How is it?" "What?" (As many men, so many opinions). The stories, as well as other material in your magazine, are of extreme interest to me.

In the story, *The Master Ants* (May issue of *AMAZING STORIES*) the author describes the world of the future as dominated by insects, mostly of the arthropoda branch, class insects. Man is inferior to these animal classes.

The Time Travelers after being rescued by the "Scientists" send a message via a time machine, to our present. The future world is overrun by ants. How, then, by sending a warning to our present, could the actual future, as described, be changed? The actual future would be fixed if the warning were heeded, but the actual future is not changed, so why send a warning?

What would you and I do? I would say that I believe that time travel is possible. May be I believe that time travel is possible. *AMAZING STORIES* is a very interesting magazine.

ANTHONY BURNHAM.

[The views expressed by one of our younger readers are very interesting and coincide closely with ours. You can tell your associates to "go ahead" as they say, about the idea of impossibility. Professor Simon Newcomb, one of the greatest astronomers that America has produced, asserted some decades ago that it was absolutely impossible for man to fly by heavier-than-air machines. Moreover, he "proved" it mathematically! We are living in an age of miracles of invention and achievements and the best scientists are those who are slow to pronounce anything to be an impossibility. Some years ago a doctrine called the "Conservation of Force" was promulgated and a curious little book was published giving views of present scientific opinion on this doctrine. It is interesting to see how Paradox in his mastery, while he could not accept it, seemed content to pronounce it impossible. The world, as we found it, was absurd and true and the doctrine of the "Conservation of Energy" took its place. This, however, in relation to his doctrine, I must say, is a colossal scientific snafu. I must say I rejected it, as was regarded as outside the pale and now there's a new invention to believe that at least some of energy may not be as absolutely true as it has been taken to be.]

Your letter is very interesting, however, and your presentation of the problems of present and future is certainly very well put. We hope you will continue to enjoy *AMAZING STORIES*.—EDITOR.]

A QUESTION OF ORIENTATION

Editor, AMAZING STORIES:

In Dr. Keller's story, *The Yeast Men*, it seems to me he has overlooked one important point. He states that the enzyme yeast men when projected from the gun would start their movement directly forward from where they dropped. The law of averages would indicate that at least twenty per cent of them would alight facing Moronia instead of Exupenta, in which case they would walk right into Moronia. This would have proved a boomerang indeed.

In spite of the inevitable inaccuracies in some of the stories, I enjoy *AMAZING STORIES* very much and have seldom missed a copy.

S. N. MOSELEY,

Hazel, Tennessee, U.S.A.

[Similar criticism about *The Yeast Men* has been voiced by others, so we'll have to suppose that their alighting was arranged in some way to keep them headed away from the Moronians.—EDITOR.]

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RADIO NEWS LABORATORIES

In this section all apparatus was awarded the *RADIO NEWS LABORATORY CERTIFICATE OF MERIT* in the month past, is listed, and a technical description given of its purpose and characteristics.

I WANT TO KNOW

This department is conducted by Mr. C. W. Palmer. Its purpose is to answer the difficulties of our readers. The value in which the "fans" hold this section can be better realized when one considers that there are over 3,000 letters received from readers each month. Naturally only the most important ones are printed in *RADIO NEWS*.

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A CHARMING LETTER FROM TWO YOUNG SCHOOL GIRLS

Editor, AMAZING STORIES:

We, two fourteen-year-old schoolgirls, are taking the liberty of writing to the Discussions Column of your popular magazine.

We read your Discussion section as well as the rest of the magazine with great interest every month, and have not noticed letters from many girls in the 'teen age.

This certainly cannot be because girls do not read AMAZING STORIES. Whenever we go to our magazine to school, everyone wants to borrow it at once.

Before giving our own criticism, we would like to say a word or two about the letter written by R. F. De Britz. He complains about everything regarding the magazine, which is the reason we complain about. Such letters as that of Mr. De Britz only go to prove the worth of your magazine, as Mr. De Britz plainly is of the class of persons who do not buy anything unless it is well worth the price.

In one of your recent issues, we read a story by H. G. Wells, called *Folloch and the Perish Man*. There is no science in it, but may we say that it is more interesting than most of H. G. Wells' stories? We like the other authors very well. As we are taking a science course at High School and are in our second year, we sometimes find your magazine very helpful.

We read in "Discussions" something about a Science Club. If possible, we would like to know more about this club.

We have nothing to say about AMAZING STORIES other than that we certainly think the magazine is worth its means of price. Wishing the magazine every success in the future, we remain,

VIVIAN CROSBY and

LETTIE PRINCE

Kelvin School, Winnipeg, Man., Can.

[It is a pleasant thing for an editor to picture to himself his correspondents and to wonder how they would seem to meet them face to face. This letter would seem to meet them face to face. This letter is so charged with kindness and good will that it makes us feel a very warm friendliness toward the young writers. There is one thing we wish to say: In your *Folloch and the Perish Man* you are dealing with psychology and is a very interesting bit of reading. We are glad to see, however, that while you are not doing much science, you are not doing it, did please you as a story. As regards the correspondent you speak of, we wish to publish what are technically termed "bitbacks," and we certainly cannot hope that all our correspondents will be as appreciative as you are of our efforts.—EDITOR.]

A 15-YEAR-OLD ENTHUSIAST AND HIS VIEWS ON THE FUTURE OF SCIENCE

Editor, AMAZING STORIES:

I am so enthused over the AMAZING STORIES that when I received a letter giving me a chance to read more of the kind of stories that are issued through the best magazine in the world, I immediately filled out the card without looking to see I was buying. I know that AMAZING STORIES would give me stories not only thrilling in action but full of education. I think now that I can look the world more in the face and say "I know you and your secrets, and if you have secrets unsolved I will try and solve them in some of my wild dreams. Is it not 'Extraordinary Fiction today, 'Cold Fact Tomorrow'"; yes, old world, you cannot fool me today. 'There is a realm for everything.' I am just a 15-year-old amateur scientist with some wild ideas and many schemes. But if my parents and neighbors call me crazy, or some people that will stand by me, they are the devout readers and editors of AMAZING STORIES. I feel no enmity or fear toward them because the age is fast coming where truth will dominate and personal things will be everyday talked about, and I have no real fear after reading Wells' *Remarkable* and *Magnificent* that fear is "the first limitation of man." So you see, truth is fast becoming dominant and you stories in the magazine mean, read this last paragraph through slowly.

I am making up a story, a scientific story that shows my ideas vividly and truthfully, and that with the future of this universe, nearly all of the planets are involved. I base it upon my own life. I tell the misfortunes and trying of my younger life what I think now, and the many wild dreams of what I might do, what is possible for me to do in the future, and how I save my earth from the most complicated and inexplicable scheme ever thought up from a villain's mind. I do not know whether I will make it of any length or into a group of short stories seeking each other. I am very interested in the magazine Club, and hope that the age limits are lowered.

AMAZING STORIES shall not discontinue. It has proved its place in this world as well as in space as there is life in me I will not see the best magazine in the world go to pieces. I say this simply and tentatively for what good is it in keeping something secret that is useful and truthful to the world?

Yours for a big and better AMAZING STORIES.
THADDEUS WIALEN,
3812 No. Madison, Tacoma, Wash.
[This letter, by one of our younger readers, tells its story so well that we can add little or nothing there. It is certainly not proposed to let AMAZING STORIES discontinue and we thank you for your very pleasant good wishes.—EDITOR.]



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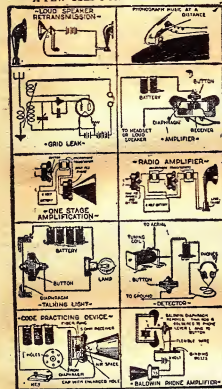
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BARON MÜNCHHAUSEN AND "THE RETURN OF THE MARTIANS"

Editor, AMAZING STORIES:

I have just finished reading the second instalment of Baron Münchhausen's *Scientific Adventures*, also *The Return of the Martians*, in the Social B. White, in the April issue of AMAZING STORIES. Did you borrow your ideas from Mr. White; did you, or have you been collaborating? Now, vice versa; or have you been collaborating? Now, ask me for a libel, Mr. Gernsback—I just asked that question to set you thinking, as the "Discussions" Editor says.

Have you ever noticed how persistently the law (or is it laws?) of coincidence manifest their (or its) power in the affairs of everyday life? During the course of my own life I have noticed it time and again. I might cite a few typical instances, about eight years ago, while making a trip down through the Middle Atlantic States and Southern States of the Atlantic Seaboard, with a couple of "pals" of about my age, one of them accidentally became separated from our little trio, in Pennsylvania. However, the two of us continued on our journey southward as we had planned to do. We saw no more of him for two months.

On our return to New York State from the South we had to change trains in Scranton, Pa. Imagine our surprise when we chanced to meet our missing pal there, as I likewise done a lot of roaming and was returning homeward (without the slightest idea of meeting us).

Again, I can cite another incident which savors strongly of coincidence—A while ago, while experimenting with ultra-violet rays, I developed a rather severe case of conjunctivitis (due, of course, to carelessness on my part). Shortly after my eyes had nearly recovered from the bad effects of this peculiar and painful derangement, my fiancée asked me if my eyes were strong enough to attend a movie. I asked her if she had any special preference and she replied negatively, so we drove to Syracuse and entered a moving-picture emporium in that city, with no foreknowledge of the bill they were then presenting. Again, imagine my surprise to find that the hero of the picture is a rather young inventor who (in the play) becomes blind temporarily, while experimenting with a supposedly new form of electric rays.

My eyes were swollen shut for two days while afflicted with conjunctivitis, and so, you see, I could sympathize with the poor young inventor in the play. I could name many other cases but for lack of space and so must curtail this narrative.

Oh, yes! Last, but not least, there are two *Martian Stories* in one issue of a magazine. It is that not a good example of a coincidence?

C. J. GOSWAMI, 17 N. 5th St., Fulton, N. Y. (Co-incidence has played a very curious part in the life of many people. Believe in spiritualism, in premonitions and has been responsible for a good deal of what we may term plain superstition. You can cite a coincidence yet which shows how many years will pass without any more of them. The reason why there are no *Martian Stories* in one issue of a magazine. We have found that our readers like them and so we put them in. The two stories were first published in 1915. Each story is independent of the other.—Editor.)

A VERY AMUSING LETTER; SUICIDE THREATENED!

Editor, AMAZING STORIES:

Although I am only seventeen years old I think I have something of interest to tell you in regard to "thing"ing.

It all began about three weeks ago with the appearance in my science class, of an old man who started being rather "thing"ing. He appeared there quite often and I soon grew to be an intimate terms with him. From the very first he seemed to know all about my personal and private affairs without my having told him anything of them and he seemed to take a special, almost exclusive, interest in me. I asked him how he happened to know all these things about me when we were so far apart. He had been pursuing my friends to obtain his information, and he said:

"Well, I'm just concocted enough to tell you. As I count myself a pretty smart man it naturally follows that you're a fairly bright boy and can be trusted with what I am about to tell you. Now, be exact, and—"

"Who's his name too?" I cried in surprise. "Correct. Except that the adverb 'too,' is superfluous, for we are one and the same person." When he put (I) said that, Mr. Editor, I was so surprised you could have knocked me over with a pick-handle, but as I am a confirmed reader of your magazine, even this didn't stun me for long and I soon recovered my breath and begged him to go on.

"Now," he continued slowly so that I might be sure to follow what he was saying. "You see I have invented a method of time traveling, and whenever one of my first visits would be back to my boyhood days, just for the sake of curiosity and also to interview you for my autobiography as you will doubtless refresh my memory."

He had his nerve, interviewing me? Why if it hadn't been for me he couldn't have been here in the future, much less come back to the present, but I said nothing and he continued:



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"I am the professor of Biological Chemistry at Rice Institute and being an avid reader of AMAZING STORIES my thoughts kept turning to time-traveling as the most worthwhile adventure of them all and so I set my talents along this line. I wasted six years trying to build fourth dimensional machine but failed, then turned my attention to drugs. I have now developed a drug which does not get to the body, but along the mind or spirit, that is, the intelligence which functions through the brain, to go free and leave the body completely, and as space and time are only encumbrances of the mortal, physical body, I can go any place and get there any time I wish."

"But you don't look like a ghost," I told him. "Ah, indeed I am not," he replied. "my soul came back to the year 1928 and seeking a healthy diet in the state asylum. I surpassed his perfectly healthy body and as it had no mind, only instincts, the job was easily done. On my good and sane behaviour I was soon let out and then I came to see you, and I mean, or maybe I should say OUR body now (or, I mean it will be in thirty-three years) rests in a vault locked from the inside, in Houston, Texas."

"In a few more days I shall concoct another poison of my drug, you see I can't very well take it with me, so I have to make it fresh every time, and so see what's happening in 3028 A. D." I asked him to tell me some things for me but he said no, the surprise are what make life interesting.

Now, Editor, I have always planned to be an artist and thought I would be, too, but it seems that I am to be a school teacher, and, as I have an artistic temperament and the weather is warm today I think I'll commit suicide as soon as I finish this letter. Will you be so good as to inform my parents that my body can probably be found a short way downstate from the Walker Street Bridge?

Thanking you, I remain

Yours truly,

DOX NABURUS,

423 W. Park Place, Oklahoma City.

P.S. Since this time of the text was written I am alive I am just beginning to wonder if my suicide will be a success.

Your letter is what the boys call a "guzzle." As we have had to say in other cases, we think it will speak for itself and the old gentleman you refer to undoubtedly a crank. Don't you think that instead of committing suicide you'd better form a partnership with your old friend and take a nice trip into the hereafter, and then come back and tell the readers of AMAZING STORIES what happened?—Euros.]

A CORRESPONDENT WHO REALIZES THAT TASTES OF READERS VARY— SCIENCE CLUB

Editor, AMAZING STORIES:

Ever since AMAZING STORIES has been first published I have been a regular reader, inasmuch as I have never written you before, I am taking the liberty of writing you now on two subjects. The first is the magazine itself. It is extremely difficult for me to criticize the text appearing in it because I am one of those who put criticism to himself. Suffice to say, however, I find no fault and even if I did find any, then I would have to keep them to myself for it is a well-known fact that what one likes another may dislike and vice versa, or as the Romans used to say, "Do quibus non est dispensatum."

The second subject is the proposed Science Club, about which I have read in several issues. The idea that gentlemen of your own kind should be proposed by Mr. D. Mason in the April 1928 issue, I think that his idea is the best so far. What surprised me was that my opinion has been taken to promote such an extremely interesting club. It seems to me that outside of the educational advantages of such a club there are the most enjoyable way of advancing the interests of science.

I, personally, would like to get in touch with Mr. Mason so we could discuss our criticisms together and see what we could do about starting this club on its way. If Mr. Mason wishes he can write me and we'll "twirl" it over.

My idea for putting the "Science Club" into action is as follows:

1. To have a representative of Canada and the United States.
2. To have a representative from each state.
3. To have a representative from each city in the two nations.
4. Those representatives will handle all correspondence and direct the activities of their centers, reporting the state or provincial representative everything that is being done. This state or provincial representative will in turn report to the national representative who will see to it that anything of interest is made known to every member who may know of the whole club's activities.

This is my idea for keeping the club up. The next thing is to see how this interested can be known their interest and do something about it. The best way that I think this could be brought about is for all possible members to send in their names and addresses to the editor and let the editor publish them in the DISCUSSIONS.

M. M. PHELPS,

4271 Laval Avenue, Montreal, Canada.

[This letter, from a viewpoint which, we are glad to say, fits a number of others, is a comfort.

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The correspondent says that it is difficult for him to criticize and goes on to intimate that if he did find fault, he would have to keep it to himself because tastes vary. And this variation of tastes is precisely the basis of the editor's problem. So many thousand people read AMAZING STORIES that it is absolutely impossible to please all and the editors are not concerned enough to want to force their views on anybody. We certainly appreciate your letter.

As regards the Science Club, we will have a most interesting announcement regarding this very shortly.—EDTOS.]

AN ADMIRER OF KELLER, WELLS AND VERNE—CRITICISM OF TIME MACHINE STORIES

Editor, AMAZING STORIES:
I have read AMAZING STORIES since its first issue, and have kept every copy ever published, including the AWARD and QUARTERLY issues, for future reference. And I will remain one of your ardent supporters just as long as it is possible to do so.

The best stories, I believe, are written by Dr. David H. Keller. He has the knack, which very few of your writers possess of combining science, romance and pathos, all in the same gripping story. For example, take *The Revolt of the Pedestrians* and *A Biological Experiment*.

As for the critics of Wells and Verne. I like both, and anybody who doesn't is probably not too high enough intellectual plane to understand them with sufficient clarity. They say Wells' stories are slow and too long drawn out. But does he say any more than is necessary to put across his idea? And in addition, a reader of Wells, or Verne, will get more out their stories from a grammatical standpoint than the readers of stories written by many of the "favorites," who murder the "King's English" atrociously. When we went to school we read Milton's "Paradise Lost" and "Paradise Regained," and Burke's "Conciliation of the American Colonies" and poems by Burns, Shelley, Keats, etc., to gain a command of our native language. Was anything ever more drawn out than those first-named books? So, if your readers find Wells too slow for them, I believe the benefit they would obtain grammatically would pay for the time spent in the reading.

Regarding these time machine stories, they make good reading, but it is an example of pseudo science which will never, never become real science. Some time ago one of these stories was published in which the inventor had three machines, or small samples of his machine which he sent into the past or future. Now, supposing this gentleman was giving a demonstration of these machines to some friends. He has three working models. He tells his friends that in ten minutes, by the clock (and you can't figure the time as recorded by the chronometer), he is going to send one of these models into the past five minutes. That is, five minutes before the time ten minutes hence, or five minutes in the future from the present time. In other words, the clock says 8:30. At 8:40 the inventor intends to send into the past five minutes one of his machines. All right, the clock ticks on and at 8:35 a model of his machine makes its appearance on the table. Now let's see, at 8:30 he had three models, and at 8:35 he has four, one more than was ever manufactured. The original three, because he hasn't sent the one into the past yet, and will not until 8:40, and the one which appeared at 8:35. He has these machines, four of them, for five minutes. Now the gentleman's intentions are good, he fully expects to send this machine into the past at 8:49. But at 8:40 the inventor's pen which prevents him sending this machine into the past. You say that's foolish, that the machine wouldn't have appeared at 8:35 if something was to happen to stop his sending it back at 8:40. Is that any more foolish than the fact that he was in possession of four machines for five minutes, when only three were ever made? If he didn't send the machine back at 8:30, he would be possessor of four machines forever. Is it any more foolish to own four machines for all time, than it is to own them for five minutes, when only three were made?

Now, as to sending a larger machine into the future. The clock says 9:00. The inventor says he will go into the future at five, ten, or fifteen, or 240. He disappears. His machine stops. The clock registers 9:10 to him, because he is ten minutes in the future, or ten minutes before 9:00 o'clock. To his companions the clock says 9:00. The same clock, remember, registers both times as an example of the same thing (the machine placed at one). The inventor now will have to wait ten minutes until his companions catch up. But can he? The clock ticks on. Five, ten, fifteen, goes. To the companions of the inventor, the time is now 9:10 and the traveler into time should appear. But does he? Not in the next ten, ten minutes have passed for him. Not the same ten minutes, but ten future minutes. While the inventor waited ten minutes, the clock was not idle, and at 9:20 to his friends, it was 9:20 to the inventor, and he was still ten minutes in the future. The only way he could see his friends again would be to journey back ten minutes.

This idea of time such a thing as time, because of its infinity, "is the bunk." And the fact that we cannot measure time, that everything happens simultaneously, and is registered on our brain in sequence, is more bunk. Because, as I said before, doesn't say it is a compact thing, and all in one place, and then registers on our brain as millions

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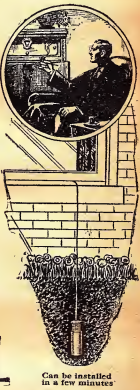
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and billions of light-years, does it? Space, in finite space, can be measured. Time, infinite time, can be measured, and we use a clock to measure it. Therefore, in all treatises on time, the clock, or measure of time, must enter into the calculation. Is it not so? As for happenings registering on our brains in sequence. Why should they register in order? Seems to me there would be an awful jumble. And there would be quite a few examples of text on an infinite number of things being in the same place at the same time. And I know that I, myself, would be in an awful large number of places at the same time.

Without this theory of no time, the time machine stories would fall flat.

Now, if there is anything wrong with my reasoning, I would like to know wherein the error, or errors, lie.

LESTER A. MAPLE,
Box 643, Lisbon, Ohio.

We are not so sure that we know all about time at the present state of science. While our correspondent gives a seemingly lucid explanation of certain mechanics of time, we append herewith the modern Einstein conception, which we take from the book, *Relativity vs. Relativity*, by Charles Lane Poor, Professor of Celestial Mechanics of Columbia University.

"The time interval being larger, a clock must run more slowly, or as Einstein puts it: 'As a consequence of its motion the clock goes more slowly than when at rest' (41). Now, this statement, or assertion, or assumption of Einstein in regard to time and time intervals is in direct opposition to our fundamental concepts, it violates our whole mode and method of thinking. Heretofore, time has been thought of being independent of everything and everything; time was the same for all portions of space; for all bodies, whether in motion or at rest; a minute was a minute the world around and everywhere in space. This identity of time and time intervals Einstein denies: according to his relativity theory, time depends upon motion, and every body has its own particular time: unless we are told the reference-body to which the statement of time refers, there is no meaning in a statement of the time of an event' (32). The faster the body moves, the longer become the time intervals. The earth travels about the sun at a rate of 68 miles per second, Mercury at from 23 to 35 miles per second, depending upon its place in its orbit, and Neptune at only 3.7 miles per second. To an observer on Neptune, therefore, the interval of time, which we know as a year, would appear shorter. This to an astronomer on Mercury the year would appear longer. While the speeds of the planets thus differ greatly, they are all very small fractions of the speed of light, and hence the variations in time intervals will be very minute, only about one part in a hundred million. The lengths of the years as measured on the earth and on Mercury, would differ by only a couple of seconds or so.

"This basic idea of the relativity of time should be thoroughly understood, for a further illustration may aid us in forming a conception as to what relativity, as enunciated by Einstein, really means. A CLOCK GOES ONLY WHEN IT IS IN MOTION. FASTER A BODY MOVES THE LONGER THE TIME INTERVALS. As the speed of a body increases, therefore, a clock runs more and more slowly, and each minute and second becomes longer and longer. Supposing that as I write these words, my room could be sealed up and shot off into space with a speed approaching that of waves of light, with a speed increasing as I write these words, my room could be sealed up and shot off into space, with a speed increasing as I write these words, and more slowly, each tick would represent the passing of an hour or a day, perhaps even of a year of ordinary earth time. It would not be the difference, my heart would beat regularly, but each beat would mark the passing of months. At the end of half an hour my clock, and before that paragraph could be completed, my room would have traversed the depths of space and been returned again to my island home. But as I glance up at my paper, what a change of scene! The peaceful boy on which my windows gaze, would be filled with strange, alien creatures would troop around, and I would learn that America had fallen, as Rome fell, centuries before. The name of Harding, Lloyd George, Frazier would be meaningless; the World War even would have been forgotten, or remembered only to plague some schoolboy with the histories of lost and long forgotten races. This is what relativity of time really means.

"Now motion takes place in space and, if relativity be true and time varies with motion; time and space can no longer be considered as independent; they are bound together in some way, neither can exist without the other. A point in space cannot be thought of without preceding a time, and an interval of time has no meaning except in connection with a definite moving body in space. It is perplexing to try to picture a body in space, if it is definitely true, if space is allowable in an independent relativity, that, even under the old concepts of time and space, it is extremely difficult to conceive of time without space and space without time; yet the essential point of the old concepts, the independence of time and space, is easy to understand; that an instant of time is the same instant throughout all space, that an interval of time is the same, whether measured in one part of space or in another, upon a body at rest or upon a body in motion. It is this essential point in the old theories that the relativist denies. Time, ap-

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conform to the new theory, is relative, relative to position in space and to the motion of bodies...

BOB OLSEN AND THE FOURTH DIMENSION

Editor, AMAZING STORIES: I am a sixteen year old boy, a Junior in high school. I am interested in Science and am a regular reader of your magazine...

I have now decided to register about your stories because I realize how hard it is to please everyone and so, when I come to a story I don't like, I just pass it up.

However, I do like to go through the stories and see what faults I can find. Here are a few things I wish you would set me straight on...

In Bob Olsen's Great Fourth-Dimensional Robotics he describes a cube as seen in the fourth dimension or rather a four dimensional object...

Now everything is composed of atoms (nervous statement) and if this other "plane" were to be really immaterial and existent, it would have to be composed of atoms and molecules...

JAMES PHELPS, 224 N. Main St., Edwardsville, Ill.

To carry out the fourth dimension materially would be quite a puzzle in Mr. Olsen's story, which makes your criticism perhaps ample on this account...

TIME AND THE FOURTH DIMENSION

Editor, AMAZING STORIES: Peculiar that a letter like that of Mr. D. L. Cummings of Elizabeth, N. J. could disturb my peace of mind to the extent of forcing me to do a thing that I most detest and hate writing letters...

Beside the present we have also the past, the future, too. We leave the future alone. We will take care of itself, speaking dimensionally, a fourth dimension is just as plausible as a first, second or third dimension...

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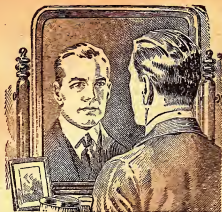
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Glancing through the advances made in science, of electricity, chemistry and physics within the past few years, one is really dumfounded at the rapid strides that have been taken. For just an example, The electron. It exists, it has almost no mass, its life defies all conception of time as we know time. It is there, indisputably there, Unhindered energy. What is it? It is there. But the plane that it moves in has not been; when that is done I am sure that we shall be a great step nearer to the fourth dimension. Then again it would hardly be worth while to invent atoms and molecules. These are not abstract terms Mr. Cummings; in some cases these have been drawn and classified, but they have never in fact existed.

The immaterial can and will be associated with material bodies in time. Of course the imperfect association of the sciences causes many and conflicting theories. Future, according to the science mentioned can be attained only through the medium of a propagation. The science of theology tells us that the future can be attained only in after-life. The science of Sociology tells us that there is no after-life, and that in some cases propagation as a medium to the future is not absolutely needed.

All very incomprehensible to me, but I am, very confusing but good reading. I read all my stories with a grain of salt, take them as they are meant, as fiction and nothing more, and certainly enjoy every minute of AMAZING STORIES.

This is a good long one for one so out of practice. I hope that it will be taken in the spirit meant, merely pitting opinion against opinion. Just hang right on to Paul; he could hardly be replaced as a moment's notice for the work that you require. Keep up the good work.

122 Winter St., Bridgeport, Conn.
[As you say, anything can be tampered with on paper. One of the troubles of this age is that too much has been so tampered with that a bewildering number of theories are formulated and each formulated in what we call "Scientific" certainty of his own verities.—Editor.]

A YOUNG EXPERIMENTER IN TELEPATHY

Editor, AMAZING STORIES:

I am only thirteen years of age, but I would like to say a few words on the time-four-dimensional theory that you have played up so much in your stories that you have published.

I must insist on there being a fourth dimension, why pick on time? You might as well weigh, temperature, and hardness, etc., all of which would be a lot of "bumk." True, all are factors, but they are not dimensions. Dimensions are concerned with linear measure.

Let us assume that we are transported to a two-dimensional world. A circle, flat on the ground, would appear as a straight line, being on a level with the eye. Thus, we would be unable to see it by not seeing the circumference. With our three-dimensional senses, we are enabled to see only half a sphere, so with four dimensions we should be able to see the entire area of a sphere. When we can use this dimension, we will be able to see the other side of the moon without going there.

Mental telepathy is not impossible, as you think. Another boy and I came to talking about the subject, and we decided to give it a tryout. I closed my eyes and made my mind as complete a blank as I could, while the other tried to transmit a thought to me. I received the same thought that he sent, and that was a picture of a "Kean Man." We tried this out on each other about twenty times, using different thoughts, and six trials were successful. Try it out yourself, some day.

LEONARD MAY

133 Lexington Ave., Jersey City, N. J.
[Regarding the fourth dimension, which we discuss today are in accord, that the fourth dimension really must be time. The following excerpt, taken from the book "Conception of Space" by Charles Lane Poor, Professor of Celestial Mechanics of Columbia University, should be of interest to you:

"If space and time are thus connected, it should be possible to express the connection in terms of mathematical symbols and equations. To illustrate the point and for this purpose that the formulas and methods of Four Dimensional Geometry are introduced into the relativity theory. To complete the very words, four dimensions, are enough; anything less, once becomes incomprehensible and absurd. Yet there is no reason for too overvalued idea: in the broad sense of the words, there is a new or startling in the four dimensional world, in which where the event, but when that, in order to describe fully an event, we must tell the place where the event occurs, but when. To speak of the Battle of the Marne does not definitely fix the event, for more than one place in space have three distinct battles on the Marne. The when, the date, is essential if we are to particularize a certain definite battle, or event. To fix definitely the place at which an event occurs requires three elements, or coordinates, for all objects in space have three elements, length, breadth, and thickness. To locate the place of the battle the three place elements, or coordinates are, the surface of the earth, the latitude, and the longitude of the point on the river at which the battle was fought. But to identify the First Battle, or the Second Battle, or any particular event of either we must have a fourth element, the date on

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which the event happened. That is, to completely identify any event, a latitude on the earth's surface, we must have four elements: three to fix the position in space, and one to fix it in time. Thus in the broad, general sense of the words, we live and have our being in a world of four dimensions, and maintaining speaking it requires four numbers—statement, or coordinates, to identify fully, in space and time, an event or happening.

There is nothing in this. But what is new, what is startling, is the point emphasized in the relativity theory, the introduction of a definite mathematical relation between the space coordinates and the time coordinate. This relationship is introduced through the adoption of the Lorentz transformation equations, heretofore fully explored, and was specifically brought out by Minkowski.

As to mental telepathy, AMAZING STORIES' sister magazine, SCIENCE AND INVENTION, maintains that there is no such thing and that mental telepathy has never been proved. The magazine is willing to pay a large cash prize for absolute proof of mental telepathy. If you actually have such proof, you can make a good deal of money by demonstrating it to the Editors of that magazine.—[Editor.]

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TURNING THE "YEAST MEN" AROUND

Editor, AMAZING STORIES:

I have just finished reading the April issue of AMAZING STORIES and found it very interesting. *The Miracle of the Lily* was great. Another one that I enjoyed very much was *The Yeast Men*. There was one point I could not understand. I, for one, cannot see how the Moronians could have won over the Yeast Men. The author is telling us how the Yeast Men were shot out of machine guns and started walking in the direction in which they were being pointed. I do not see how the Moronians led some Yeast Men around in a circle. The Episcopians knew this was possible because Herr Schmidt says that Yeast Men draw a large circle on the streets. Each machine shot 172,000 men per day. Five hundred guns could shoot 86,000,000 men per day. Instead of trying to cut through the streets, the Episcopians Premier could have ordered out the 50,000 men that he had recruited. I have read the Yeast Men about and start them in the direction of Moronia. Each man would have had to take care of about 1,700 Yeast Men, which would have been a very hard task.

I heartily agree with John P. MacIsidor, Portland, Me., about the Wells and Verne stories, and the contents in the Annual. With the exception of very few I find Wells and Verne stories, and the contents in the Annual. With the exception of very few I find Wells and Verne stories, and the contents in the Annual.

How do these more stories by the author of *The Iron Foot* and *The Face in the Abyss*. These two would about the best stories I have read in the AMAZING STORIES Magazine, but since they appeared in an issue of at least six months ago, I have never seen another like them.

Now that I have read everything wrong with the AMAZING STORIES Magazine, I don't suppose there will be much chance of this letter being put in "Dimensions."

JACOB SCHWARTZ,

1474 Park Place, Brooklyn, N. Y.
 [Perhaps the Editor of AMAZING STORIES has found it was quite a difficult problem to turn the vast number of Yeast Men, and it would have taken them many months to handle the 86,000,000 you speak of, one by one, and individually. "The Moon Pool" has met with wide approval. More of Mr. Schwartz's work will appear in our columns soon.—[Editor.]

A VIVID TRIBUTE TO A MERRITT

Editor, AMAZING STORIES:

I am writing to acknowledge receipt of your excellent issue containing *The Master Mind of Marx*. The story is marvelous; the magazine is at the level in its way. Fortunately, I was I enthralled by Merritt's *The Face in the Abyss*, and even more, by the announcement that the author is available for a sequel. I know not how your other readers may feel about it, but for myself, in view of his lyric and epic masterpiece, *The Moon Pool*, that you should at any time take an interest only that Merritt has Miltonic visions, vast shadowy legends, which he has the power to express in unadorned, simple prose with dashes and dashes and Shelley—as I say, in view of that achievement, as well as *The Metal Monster*, a pure epic poem. His clear style, if it is encouraged, he is displaying an abiding contribution to the literature of imagination in the promised sequel to *The Face in the Abyss*.

Please do let me know whether he has finished the sequel or, if not, when I may look for it in AMAZING STORIES.

I am a Senior at the University of Wisconsin (major in History) and regard my eyes, tired with "watching our man's mortality," as displayed in the delicious if colorful pageant of the world, by journeying to the realities in the dreams via the pages of your priceless publication.

ROBERT C. SCHAUBLE,
 7045 Main Street, Janesville, Wis.
 [Mr. Merritt's stories have won great enthusiasms from our readers and we hope that his hitherto literature will continue to excite. Your college work seems to have increased your appreciation of this author, whom we, jointly with you, esteem.—[Editor.]

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In regard to the magazine as a whole, I would advise a change of cover and name. At present, these give the impression that the magazine is of the purely sensational type and therefore does not appeal to the better class of people. Those persons who crave that type of literature, upon opening *Amazing Stories*, immediately reject it because it is not what they want. Furthermore, I am sure this is not the kind of customer you are reaching for. The result is, you get neither, except by chance. If you would change the cover name, keeping the contents the same, more of the intellectual class would buy it. This letter is longer than I intended, but I hope it has not proved tiresome. My criticism may seem childish (I am 15 years of age), and in many cases mistaken, but it is my first attempt as a literary critic.
 KENNETH R. JOHNSON,
 247-7th Ave. W., Clinton, Iowa.

P. S.—I have included nothing concerning the fourth dimension since I know so little about it. However, I would like to ask this question: What foundation or evidence is there for such a theory? Scientists, in propounding a theory, do so because of evidence pointing toward it. So far I have been able to find no such evidence suggesting a fourth dimension.
 [We claim that we publish indifferently, letters of derogatory as well as those of favorable criticism. The reason a larger number of appreciative letters are published than of the others, is because comparatively few of the first class are received by us. This letter from a young reader tells his story so well that criticism on our part is not required. It is Einstein who has used the fourth dimension in his work more than other theorists. See also Prof. Poincaré's text on page 569-569.—Ezra.]

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SOME CRITICISMS AND VIEWS OF A YOUNG READER ON MARRIAGE

Editor, **AMAZING STORIES:**

Having finished reading the June issue of your magazine, I offer the following comments for what they may be worth:

The Terrible Sign: An exceptional story, even for Wells. The sequence of events is orderly, logical, and lifelike. This is what gives his (Wells) stories their quality of reality. The plotting moves along in such a natural manner that one feels it might actually have happened.

George Zerkow's Adventure: Although I must give it second place, this is good for the same reason as the above. Nothing phenomenal is introduced without reason, simply to make the story amazing.

The Blue Dimension: Very good to the denouement, where it falls with a dull, sudden flap. Why couldn't the very stupid assistant have passed a long rope or piece of cloth through the machine, which the Doctor could have grasped and so have been pulled back through? The author ruined a good story here by his anxiety to give it a drizzly ending.

A Biological Experiment: Interesting, and well written, but it seems to me that the primary postulate of the story is fallacious. It seems that notwithstanding it is much more a necessary evil than a blessing to the race. See it as one of the causes of crime, and if it could be eliminated the race should be much larger instead of the opposite. If the author seems to advance the argument that it is God's will, I refer him to the words of the Master, "There will be neither marriage, nor giving in marriage in Heaven."

In order that you may properly value the above outpourings, I will state that I am 21 years of age, and have been reading **AMAZING STORIES** for two years.

I. B. DEXON,
Box 501, Fort Smith, Ark.

[We shall have to evaluate what you call your "outbursts" on the basis of what you say. Nothing would please us better than to hear from you some time in the future as to being in touch with a good wife and numerous offspring. Your question as to marriage, you will observe, applies to Heaven. In this prohibition, the earth is not included, but is a heaven. If sex could be eliminated, as you say, whether the race would be happier or not, it certainly would dwindle very rapidly.

We've always said that we would not attempt to publish selected favorable letters from our readers to the exclusion of unfavorable ones. The very reason so many agreeable letters are published and so few condemnatory ones, is that our correspondents seem to be a very appreciative lot. The next time you end your letter, after all your criticisms, saying that you read "our **AMAZING STORIES**" each month, your letter will be criticized as highly appreciated.—**EDITOR**]

ANOTHER OF OUR YOUNGER READERS PRAISES OUR WORK

Editor, **AMAZING STORIES:**

This is my fourth attempt to get into print. I am 14 years old and have been a reader of **AMAZING STORIES** since July 1927.

H. G. Wells is the best author you have. Those who criticize Mr. Wells should stop to think that Mr. Wells has studied under Professor Huxley. As a writer he is classed with Scott and Shakespeare. As to his stories I have liked every one of them. I have not one word of criticism on any of his work.

The War of the Worlds was without question the best story you ever printed.

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