April

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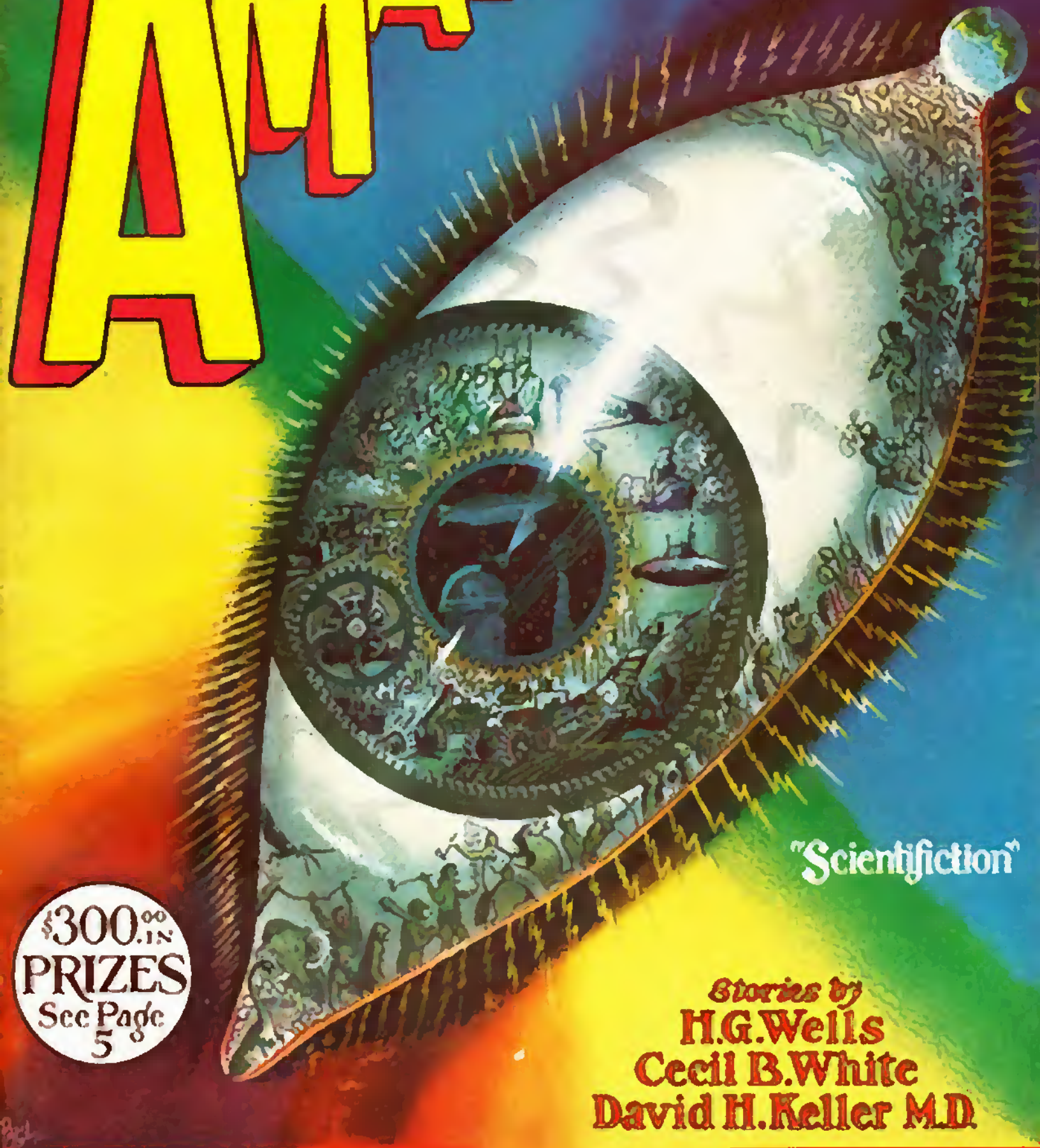
AMAZING STORIES

HUGO GERNSBACK
EDITOR



"Scientifiction"

$300.00 IN PRIZES
See Page 5

Stories by
H.G.Wells
Cecil B.White
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EXPERIMENTER PUBLISHING COMPANY, 230 FIFTH AVENUE, NEW YORK, N. Y.

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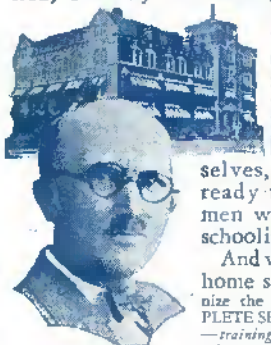

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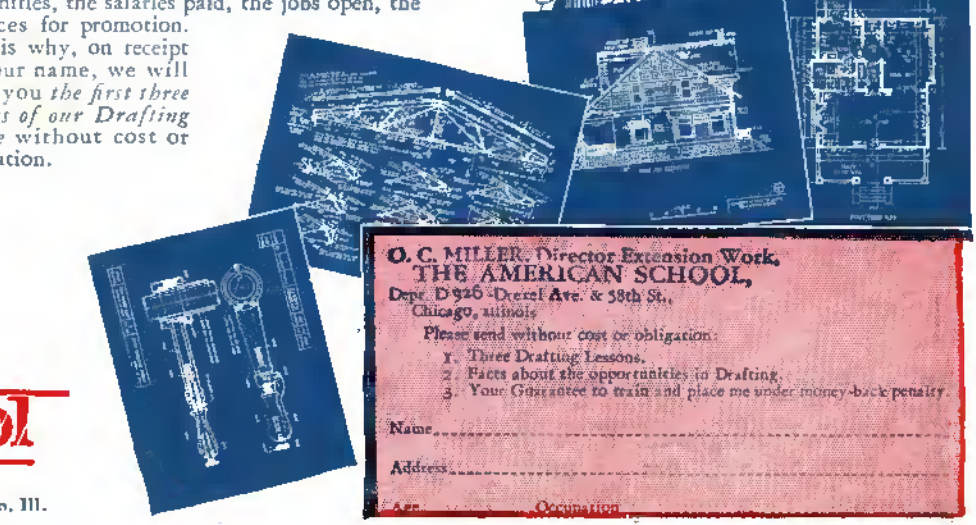

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JULES VERNE'S TOMBSTONE AT AMIENS
PORTRAYING HIS IMMORTALITY

AMAZING STORIES

April, 1928
Vol. 3, No. 1

EDITORIAL & GENERAL OFFICES: 230 Fifth Ave., New York City
Published by Experimenter Publishing Company, Inc.

(H. GERNSBACK, Pres.; S. GERNSBACK, Treas.)
Publishers of SCIENCE & INVENTION, RADIO NEWS,
RADIO LISTENERS' GUIDE, FRENCH HUMOR

Owners of Broadcast Station WRNY

In Our April Issue:

Our Cover

this month represents the subject matter in our new scientifiction contest offering $300.00 in prizes. For details, see Editorial, page 5.

In Our Next Issue:

A STORY OF THE DAYS TO COME (A Serial in 2 parts) (Part II), by H. G. Wells. Now that the author has established his mechanical changes and differences and the corresponding variations and modifications in the laws of the land, which we might well enough expect to find in the days of the future, he turns his attention, with equal success, to the inevitable changes in the trend and mode of human living in this age of mechanical concentration. It is an absorbing study in psychology.

FOUR DIMENSIONAL ROBBERIES, by Bob Olsen. If a four dimensional forceps could extract gall stones from the human body without any operation, why couldn't it be used for other material things—banknotes and jewelry, for instance? The far-reaching effects of such a discovery as a four-dimensional instrument can hardly be foretold to any appreciable degree. The fields in which such an instrument might be used are necessarily many, and our author, by this time well known to all our readers, has proved himself the possessor of a fertile mind with a turn for good writing.

BARON MUENCHHAUSEN'S SCIENTIFIC ADVENTURES, by Hugo Gernsback. As might be expected, the first novelty of being on Mars and the strangeness of the place wears off very quickly, and in the next instalments we find our friends, the resourceful Baron and his scientific traveling friend, learning all about Mars and the Martians. The Baron's periodic radio communications furnish a source of real scientific information.

THE OCTUPUS CYCLE, by Irvin Lester and Fletcher Pratt. Every once in a while we hear from explorers and entomologists of good repute, stories of the extermination even of human life in certain localities of the jungle, by seemingly intelligent and organized insects or animals of the smaller variety. This story, about a highly-developed animal of the Mollusk variety, is made especially interesting because a journalist and a scientist have collaborated on it.

HOW TO SUBSCRIBE TO "AMAZING STORIES." Send your name, address and remittance to Experimenter Publishing Co., 230 Fifth Ave., New York City. Checks and money orders should be made payable to Experimenter Publishing Co., Inc. Mention the name of the magazine you are ordering inasmuch as we also publish RADIO NEWS, SCIENCE & INVENTION, RADIO LISTENERS' GUIDE AND CALL BOOK, SPARE-TIME MONEY MAKING and FRENCH HUMOR. Subscriptions may be made in combination with the other publications just mentioned at special reduced club rates. Send postal for club rate card. Subscriptions start with the current issue unless otherwise ordered.
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"Cash in" on Your Unrealized Abilities

Psycho-Analysis Is Remaking Men and Women Into Glorious Successes by Enabling Them to "Find" and "Cash In" on Their Hidden Powers for Their Own Personal Advancement

YOUR aim in life is to succeed. You are fighting day and night, year in and year out, to find a way out of the rut—a roadway that will lead you to greater happiness and success.

After all, dollars and cents are the standards by which we judge the successful man and woman today, and so dollars and cents are the conscious aim of most of us. Men and women from time immemorial have been struggling to make a place for themselves that would free them from economic slavery. Why is it that so many succeed in reaching this goal, while others seem to be left eternally fighting and struggling against an almost insurmountable barrier? What is the answer to the problem?

Your Hidden Self and Its Startling Power

The ancient formula for success was "Know Thyself." Modern Science, however, has discovered a new answer to this problem—"Know Thine Other Self." Scientists have discovered that deep down within you, hidden from all the world, even from yourself, lies buried a mysterious "other self"—a being of whose existence you have never thought—and yet who directs the whole destiny of your life, determining your failure or success.

Since the dawn of history men have vaguely realized the existence of this strange, dual nature, this baffling two-in-one-ness of the human mind. And it is this subconscious mind, this other part of you, which is in reality the determining factor in the progress you make.

The Veil Drawn From Your Other Self

Do you ever forget to do things that you intended to do? Do you find certain tasks distasteful? Do you have unaccountable "blue" streaks? Are you inclined to be morbid—morose—unhappy? Do you ever feel as though the work you are doing is not suited to you? Do you ever long to engage in another line of work for which you believe yourself better fitted, yet haven't the courage to make the change? Do you ever feel as though "you never had a chance"?

All of the above are questions suggested to you by your subconscious mind—the mind that is the motor behind your hidden forces of new energy and vitality. It is this subconscious mind that is waiting at your command to release the floodgates of this strange power that will lead you to wealth—health—and happiness.

Often you dream! Strange, impossible dreams they sometimes seem to you. Yet these dreams are a mysterious picture language of the subconscious mind which is trying to express to you certain things, when your mind—your conscious mind, is asleep. These messages have a direct bearing on your success in life.

The amazing discovery that explores the mystic realms of the shadowy, subconscious depths below the surface of your conscious mind is known as Psycho-Analysis.

Release Your Hidden Self

Once you learn how to Psycho-Analyze yourself it is like drawing the veil and seeing for yourself the hidden being that lives within you. You see why your subconscious mind is more powerful—much more powerful—than your conscious mind, which you think is you.

The mystery of why some things are difficult is solved. You can read the answers to your impulses—your hopes—and your fears. You can understand why you do certain things—and how to avoid doing those things which bring disaster and misery in their wake. Sex instincts—repressed desires — emotional conflicts—and all the other mysteries of your conscious self are read by you like printed pages of an open book. You not only learn to understand these powerful emotions, but you learn how to direct them to do your bidding—and to obey your will. That which you long to accomplish becomes yours for the asking. You, for the first time, really become master of yourself.

Things which have held you back from your purpose are banished forever. Fear, timidity, nervousness, self-consciousness lack of aggressiveness, lack of confidence, and these other obstacles which hinder your progress become things of the past.

In thousands of cases Psycho-Analysis has accomplished seeming miracles. Yet for years, owing to the fact that this science treats largely of sex-instinct, the entire facts have been withheld from the public. Today, however, it is being discussed everywhere. Many are going to professional Psycho-Analysts for personal readings, paying enormous fees to learn the mysteries of their other selves, and to rebuild their mind for greater driving power, greater creativeness, and greater efficiency.

Life's Thousand Thrills

Life is capable of a thousand thrills, joys, and achievements, of which the average person never dreams.

Psychology Magazine

reveals these deeper possibilities and leads its readers to the exultant joy of more glorious, purposeful, healthful, radiant life.

No dry, heavy reading! But articles that are intensely interesting, beautifully illustrated, and at the same time thoroughly scientific and correct. In this monthly magazine the principles of practical psychology are given to you in a fine, easy, clear manner. The discussion of *every* human problem—whether it be of *love*, *work*, or *health*—is rendered understandable and definitely helpful to all.

A What-Can-We-Do-For-You Department is at the service of all subscribers. You write this department about *your* particular problem and you receive a dependable reply in the next issue from a noted specialist. In every issue, there is a golden essay from the inspired pen of **Henry Knight Miller**, brilliant teacher and lecturer. *There are 99 reasons why you should become a subscriber without further delay!*

Subscription Price—$3.00 a year. BUT, you can get a full year's subscription, together with Prof. Legaren's Complete Couse in Psycho-analysis at a *ridiculously low* combination price. *Read the balance of this announcement.*

Try This Amazing Test Free

And now comes an announcement of the greatest interest. It has at last become possible for any one to analyze himself or herself. In the privacy of your home Psycho-Analysis can be made to reveal the strange hidden secrets of your subconscious self.

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You have only to follow the simple method described, and you are brought face to face with your hidden self—that strange, mysterious being that lies submerged within you and shapes the whole course of your life, bringing you unhappiness or happiness, health or illness, success or failure.

In your own room, without the expense of a professional analyst, without the necessity of revealing your private affairs, you get a fuller, truer analysis of yourself than old-fashioned methods could possibly give you.

You'll be astounded at the revelation it makes. You'll be thrilled at the opportunity it offers you to obtain easily, almost without conscious effort, the wealth, the honor, the influence, the respect, and the popularity for which you have always longed. You don't have to take anybody's word for this. Prove it to your own satisfaction.

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VOLUME 3

AMAZING STORIES

THE MAGAZINE OF SCIENTIFICTION

APRIL 1928 No. 1

HUGO GERNSBACK, *Editor*
WILBUR C. WHITEHEAD, *Literary Editor*
DR. T. O'CONOR SLOANE, Ph.D., *Associate Editor*
C. A. BRANDT, *Literary Editor*

Editorial and General Offices: 230 Fifth Avenue, New York, N. Y.

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

$300.00 PRIZE CONTEST

Wanted: A Symbol for "Scientifiction"

By HUGO GERNSBACK

EVER since we had our last prize contest, last year, many of our readers have expressed the wish to see another contest in this magazine. I have given the matter a great deal of thought, and I finally came to the following conclusion:

When I coined the word "scientifiction" in 1915, I knew that sometime or other it was bound to become popular, and I even cherished a secret hope that some day it might appear in a standard dictionary.

In any event, "scientifiction" is a word that will grow with the added years. As science advances, scientifiction will advance and flourish. No one of to-day can even dimly foresee what it may produce. There was a time when science made scientifiction. The time has already come when scientifiction makes science. The author who works out a brand new idea in a scientifiction plot may be hailed as an original inventor years later, when his brain-child will have taken wings and when cold-blooded scientists will have realized the author's ambition.

An author may not know how to build or make his invention of a certain apparatus or instrument, but he may know how to predict, and often does predict, the use of such a one. The professional inventor or scientist then comes along, gets the stimulus from the story and promptly responds with the material invention. It may not always work out this way, but it is conceivable that it might in the future. The reason is that inventors and scientists, as a rule, have their noses close to the grindstone, whereas it takes an author with vision to see ahead and so to start others thinking along new lines. The inventor or scientist may not always admit the truth of this, but the fact nevertheless remains, that both are susceptible to all sorts of outside influences, more than they will admit even to themselves.

The thought occurred to me, therefore, that what scientifiction needs at present is some sort of a label—an emblem, or a trade-mark, so to speak. Scientifiction is too good a thing just to be used as a word in mere letters. It should have some dignity, and the idea itself of scientifiction should have its own crest, henceforth.

After I had come to this pass, I sat down and composed the design that now adorns the front cover of this issue. Not being a draftsman or an artist, I explained my idea to Mr. Paul. The cover picture is the result. Here scientifiction is pictured exactly what it is. The big eye represents the mind's eye. Within that eye, you have, in a pictorial presentation, everything that is represented by scientifiction. I admit that many of our readers could give the world a much better representation of the word "scientifiction," which is what this contest is all about.

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." Whatever it is, there must be no question as to the meaning of the design. It must be self-explanatory—it must be descriptive of "scientifiction." Now do not jump to the conclusion that this contest is only for artists or designers. It is not. The idea can either be sketched in black and white or in colors, or in case you do neither, you can merely type the idea out on a sheet of paper, only giving your conception of what the emblem should be. Such an entry will be just as valid as any submitted by amateur artists.

$300.00 IN PRIZES	
First Prize	$100.00
Second Prize	75.00
Third Prize	50.00
Fourth Prize	25.00
Fifth and Sixth Prize, each	15.00
Seventh-Tenth, each	5.00

Please note the following rules:

(1) A design representing the word "scientifiction" is wanted.

(2) The design must be descriptive of the idea of "scientifiction."

(3) The idea can be sketched in pencil, ink, oil colors or water colors; or the idea may be typewritten on a sheet of paper without any sketches. All will be equally eligible.

(4) No design is to be larger than 8 x 12 inches. Designs must be delivered flat, not rolled.

(5) Penciled matter will not be considered.

(6) The publishers reserve the right to publish any design, not having won a prize, by paying regular space rates to contestants.

(7) From this contest are excluded all employees of the Experimenter Publishing Company and members of their families.

(8) This contest closes on May 3, 1928, and all entries must be received by noon of that day. Prize-winning announcements will be made in our July issue.

(9) If similar designs or ideas as submitted should tie for a prize, the identical prize will be paid to all contestants thus tied.

(10) Address all entries in, and communications for this prize contest to Editor, Scientifiction Prize Contest, c/o AMAZING STORIES, 230 Fifth Avenue, New York City.

A STORY OF THE DAYS TO COME

by H. G. Wells

Author of "The Time Machine," "The Island of Doctor Moreau," Etc.

CHAPTER I

The Cure for Love

THE excellent Mr. Morris was an Englishman, and he lived in the days of Queen Victoria the Good. He was a prosperous and very sensible man; he read the *Times* and went to church, and as he grew towards middle age an expression of quiet contented contempt for all who were not as himself, settled on his face. He was one of those people who do everything that is right and proper and sensible with inevitable regularity. He always wore just the right and proper clothes, steering the narrow way between the smart and the shabby, always subscribed to the right charities, just the judicious compromise between ostentation and meanness, and never failed to have his hair cut to exactly the proper length.

Everything that it was right and proper for a man in his position to possess, he possessed; and everything that it was not right and proper for a man in his position to possess, he did not possess.

And among other right and proper possessions, this Mr. Morris had a wife and children. They were the right sort of wife, and the right sort and number of children, of course; nothing imaginative or highty-flighty about any of them, so far as Mr. Morris could see; they wore perfectly correct clothing, neither smart nor hygienic nor faddy in any way, but just sensible; and they lived in a nice sensible house in the later Victorian sham Queen Anne style of architecture, with sham half-timbering of chocolate-painted plaster in the gables, Lincrusta Walton sham carved oak panels, a terrace of terra cotta to imitate stone, and cathedral glass in the front door. His boys went to good solid schools, and were put to respectable professions; his girls, in spite of a fantastic protest or so, were all married to suitable, steady, oldish young men with good prospects. And when it was a fit and proper thing for him to do so, Mr. Morris died. His tomb was of marble, and, without any art nonsense or laudatory inscription, quietly imposing—such being the fashion of his time.

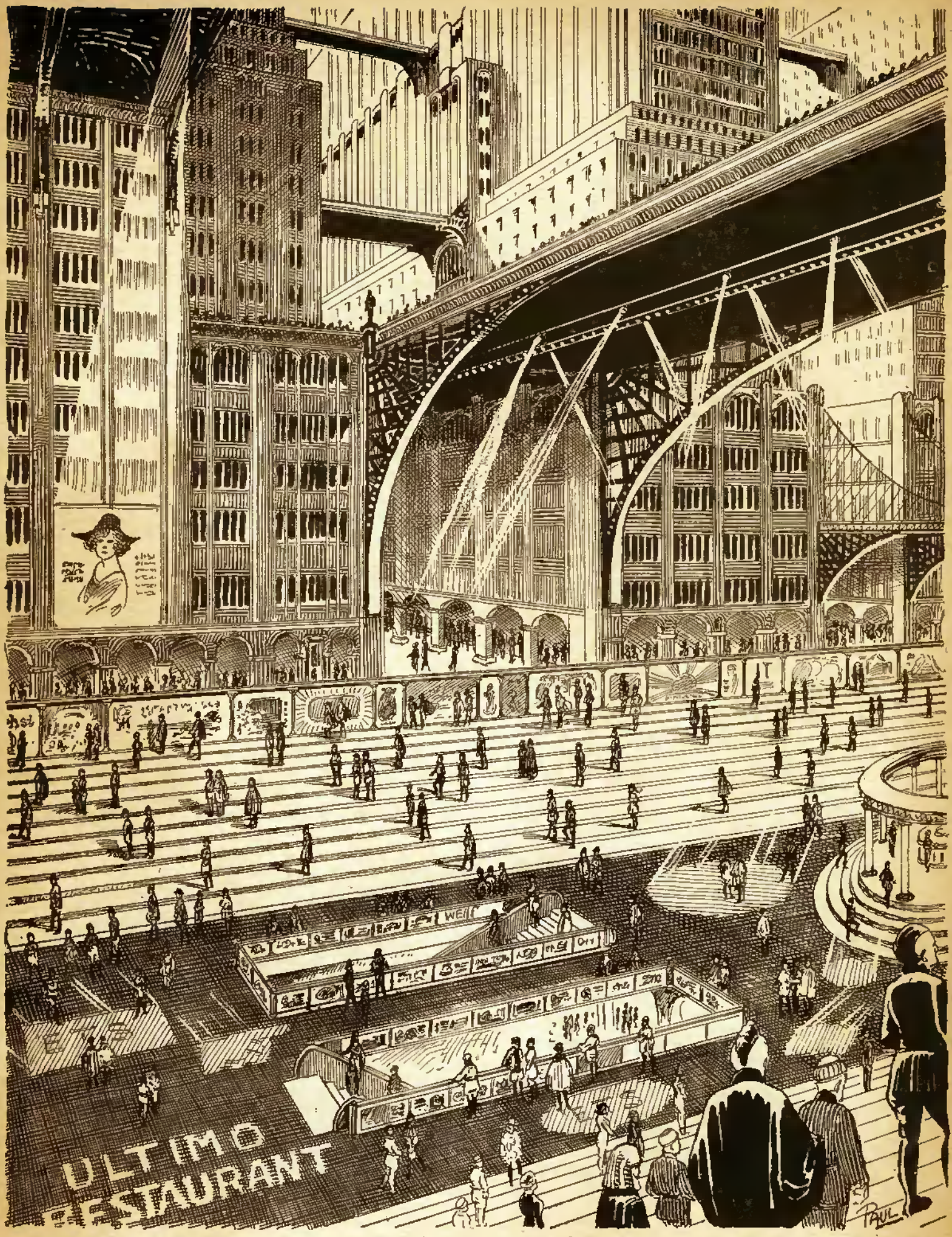
He underwent various changes according to the accepted customs in these cases, and long before this story begins, even his bones had become dust, and were scattered to the four quarters of heaven. And his sons and his grandsons and his great-grandsons and his great-great-grandsons, they too were dust and ashes, and were scattered likewise. It was a thing he could not have imagined, that a day would come when even his great-great-grandsons would be scattered to the four winds of heaven. If any one had suggested it to him he would have resented it. He was one of those worthy people who take no interest in the future of mankind at all. He had grave doubts, indeed, if there was any future for mankind after he was dead.

It seemed quite impossible and quite uninteresting to imagine anything happening after he was dead. Yet the thing was so, and when even his great-great-grandson was dead and decayed and forgotten, when the sham half-timbered house had gone the way of all shams, and the *Times* was extinct, and the silk hat a ridiculous antiquity, and the modestly imposing stone that had been sacred to Mr. Morris had been burnt to make lime for mortar, and all that Mr. Morris had found real and important was sere and dead, the world was still going on, and people were still going about it, just as heedless and impatient of the Future, or, indeed, of anything but their own selves and property, as Mr. Morris had been.

And, strange to tell, and much as Mr. Morris would have been angered if any one had foreshadowed it to him, all over the world there were scattered a multitude of people, filled with the breath of life, in whose veins the blood of Mr. Morris flowed. Just as some day the life which is gathered now in the reader of this very story may also be scattered far and wide about this world, and mingled with a thousand alien strains, beyond all thought and tracing.

And among the descendants of this Mr. Morris was one almost as sensible and clear-headed as his ancestor. He had just the same stout, short frame as that ancient man of the nineteenth century, from whom his name of Morris—he spelt it Mwres—came; he had the same half-contemptuous expression of face. He was a prosperous person, too, as times went, and he disliked the "new-fangled," and bothers about the future and the lower classes, just as much as the ancestral Morris had done. He did not read the *Times*: indeed, he did not know there ever had been a *Times*—that institution had foundered somewhere in the intervening gulf of years; but the phonograph

YOU will remember "The Story of the Stone Age," by H. G. Wells which we printed a few months ago. Here is the counterpart of that story. In the first narration, Wells goes back thousands of years and delves into the past ages of man. Now he reaches forward to the days to come and gives us a most interesting and thought-provoking tale that will live for many years in your memory. Wells advances a good many original thoughts, even in this instalment, and we were particularly impressed with his idea of hypnosis, which is not at all far-fetched, and far more possible than most of us think.



The middle space was immovable and gave access by staircases descending into subterranean ways. Right and left were an ascending series of continuous platforms, each of which traveled about five miles an hour faster than the one internal to it. The establishment of the Suzanna Hat Syndicate projected a vast façade upon the outer way, sending overhead an overlapping series of huge white glass screens, on which gigantic animated pictures of the faces of well-known beautiful living women wearing novelties in hats were thrown.

machine that talked to him as he made his toilet of a morning, might have been the voice of a reincarnated Blowitz when it dealt with the world's affairs. This phonographic machine was the size and shape of a Dutch clock, and down the front of it were electric barometric indicators, and an electric clock and calendar, and automatic engagement reminders, and where the clock would have been was the mouth of a trumpet. When it had news, the trumpet gobbled like a turkey, "Galloop, galloop," and then brayed out its message as, let us say, a trumpet might bray. It would tell Mwres in full, rich, throaty tones about the overnight accidents to the omnibus flying-machines that plied around the world, the latest arrivals at the fashionable resorts in Tibet, and of all the great monopolist company meetings of the day before, while he was dressing. If Mwres did not like hearing what it said, he had only to touch a stud, and it would choke a little and talk about something else.

Of course his toilet differed very much from that of his ancestor. It is doubtful which would have been the more shocked and pained to find himself in the clothing of the other. Mwres would certainly have sooner gone forth to the world stark naked than in the silk hat, frock coat, grey trousers and watch-chain that had filled Mr. Morris with sombre self-respect in the past. For Mwres there was no shaving to do: a skilful operator had long ago removed every hair-root from his face. His legs he encased in pleasant pink and amber garments of an air-tight material, which with the help of an ingenious little pump he distended so as to suggest enormous muscles. Above this he also wore pneumatic garments beneath an amber silk tunic, so that he was clothed in air and admirably protected against sudden extremes of heat or cold. Over this he flung a scarlet cloak with its edge fantastically curved. On his head, which had been skilfully deprived of every scrap of hair, he adjusted a pleasant little cap of bright scarlet, held on by suction and inflated with hydrogen, and curiously like a comb of a cock. So his toilet was complete; and, conscious of being soberly and becomingly attired, he was ready to face his fellow-beings with a tranquil eye.

THIS Mwres—the civility of "Mr." had vanished ages ago—was one of the officials under the Wind Vane and Waterfall Trust, the great company that owned every wind wheel and waterfall in the world, and which pumped all the water and supplied all the electric energy that people in these latter days required. He lived in a vast hotel near that part of London called Seventh Way, and had very large and comfortable apartments on the seventeenth floor. Households and family life had long since disappeared with the progressive refinement of manners; and indeed the steady rise in rents and land values, the disappearance of domestic servants, the elaboration of cookery, had rendered the separate domicile of Victorian times impossible, even had any one desired such a savage seclusion. When his toilet was completed he went towards one of the two doors of his apartment—there were doors at opposite ends, each marked with a huge arrow pointing one, one way and one the other—touched a stud to open it, and emerged on a wide passage, the centre of which bore chairs and was moving at a steady pace to the left. On some of these chairs, gaily-dressed men and women were seated. He nodded to an acquaintance—it was not in those days etiquette to talk before breakfast—and seated himself on one of these chairs, and in a few seconds he had been carried to the doors of a lift, by which he descended to the great and splendid hall in which his breakfast would be automatically served.

It was a very different meal from a Victorian breakfast. The rude masses of bread needing to be carved and smeared over with animal fat before they could be made palatable, the still recognisable fragments of recently killed animals, hideously charred and hacked, the eggs torn ruthlessly from beneath some protesting hen,—such things as these, though they constituted the ordinary fare of Victorian times, would have awakened only horror and disgust in the refined minds of the people of these latter days. Instead were pastes and cakes of agreeable and variegated design, without any suggestion in colour or form of the unfortunate animals from which their substance and juices were derived. They appeared on little dishes sliding out upon a rail from a little box at one side of the table. The surface of the table, to judge by touch and eye, would have appeared to a nineteenth-century person to be covered with fine white damask, but this was really an oxidised metallic surface, and could be cleaned instantly after a meal. There were hundreds of such little tables in the hall, and at most of them were other latter-day citizens singly or in groups. And as Mwres seated himself before his elegant repast, the invisible orchestra, which had been resting during an interval, resumed and filled the air with music.

But Mwres did not display any great interest, either in his breakfast or the music; his eye wandered incessantly about the hall, as though he expected a belated guest. At last he rose eagerly and waved his hand, and simultaneously across the hall appeared a tall dark figure in a costume of yellow and olive green. As this person, walking amidst the tables with measured steps, drew near, the pallid earnestness of his face and the unusual intensity of his eyes became apparent. Mwres reseated himself and pointed to a chair beside him.

"I feared you would never come," he said. In spite of the intervening space of time, the English language was still almost exactly the same as it had been in England under Victoria the Good. The invention of the phonograph and such like means of recording sound, and the gradual replacement of books by such contrivances, had not only saved the human eyesight from decay, but had also by the establishment of a sure standard arrested the process of change in accent that had hitherto been so inevitable.

"I was delayed by an interesting case," said the man in green and yellow. "A prominent politican—ahem!—suffering from overwork." He glanced at the breakfast and seated himself. "I have been awake for forty hours."

"Eh dear!" said Mwres: "fancy that! You hypnotists have your work to do."

The hypnotist helped himself to some attractive amber-coloured jelly. "I happen to be a good deal in request," he said modestly.

"Heaven knows what we should do without you."

"Oh! we're not so indispensable as all that," said the hypnotist, ruminating the flavour of the jelly. "The world did very well without us for some thousands of years. Two hundred years ago even—not one! In practice, that is. Physicians by the thou-

sand, of course—frightfully clumsy brutes for the most part, and following one another like sheep—but doctors of the mind, except a few empirical flounderers, there were none."

He concentrated his mind on the jelly.

"BUT were people so sane—" began Mwres.

The hypnotist shook his head. "It didn't matter then if they were a bit silly or faddy. Life was so easy-going then. No competition worth speaking of—no pressure. A human being had to be very lopsided before anything happened. Then, you know, they clapped 'em away in what they called a lunatic asylum."

"I know," said Mwres. "In these confounded historical romances that every one is listening to, they always rescue a beautiful girl from an asylum or something of the sort. I don't know if you attend to that rubbish."

"I must confess I do," said the hypnotist. "It carries one out of one's self to hear of those quaint, adventurous, half-civilized days of the nineteenth century, when men were stout and women simple. I like a good swaggering story before all things. Curious times they were, with their smutty railways and puffing old iron trains, their rum little houses and their horse vehicles. I suppose you don't read books?"

"Dear, no!" said Mwres, "I went to a modern school and we had none of that old-fashioned nonsense. Phonographs are good enough for me."

"Of course," said the hypnotist, "of course"; and surveyed the table for his next choice. "You know," he said, helping himself to a dark blue confection that promised well, "in those days our business was scarcely thought of. I daresay if any one had told them that in two hundred years' time a class of men would be entirely occupied in impressing things upon the memory, effacing unpleasant ideas, controlling and overcoming instinctive but undesirable impulses, and so forth, by means of hypnotism, they would have refused to believe the thing possible. Few people knew that an order made during a mesmeric trance, even an order to forget or an order to desire, could be given so as to be obeyed after the trance was over. Yet there were men alive then who could have told them the thing was as absolutely certain to come about as—well, the transit of Venus."

"They knew of hypnotism, then?"

"Oh, dear, yes! They used it—for painless dentistry and things like that! This blue stuff is confoundedly good: what is it?"

"Haven't the faintest idea," said Mwres, "but I admit it's very good. Take some more."

The hypnotist repeated his praises, and there was an appreciative pause.

"Speaking of these historical romances," said Mwres, with an attempt at an easy, off-hand manner, "brings me—ah—to the matter I—ah—had in mind when I asked you—when I expressed a wish to see you." He paused and took a deep breath.

The hypnotist turned an attentive eye upon him, and continued eating.

"The fact is," said Mwres, "I have a—in fact a—daughter. Well, you know I have given her—ah—every educational advantage. Lectures—not a solitary lecturer of ability in the world but she has had a telephone direct, dancing, deportment, conversation, philosophy, art criticism . . ." He indicated catholic culture by a gesture of his hand. "I had intended her to marry a very good friend of mine—Bindon of the Lighting Commission—plain little man, you know, and a bit unpleasant in some of his ways, but an excellent fellow really—an excellent fellow."

"Yes," said the hypnotist, "go on. How old is she?"

"Eighteen."

"A dangerous age. Well?"

"Well: it seems that she has been indulging in these historical romances—excessively. Excessively. Even to the neglect of her philosophy. Filled her mind with unutterable nonsense about soldiers who fight—what is it?—Etruscans?"

"Egyptians."

"Egyptians—very probably. Hack about with swords and revolvers and things—blood-shed galore—horrible!—and about young men on torpedo catchers who blow up—Spaniards, I fancy—and all sorts of irregular adventurers. And she has got it into her head that she must marry for Love, and that poor little Bindon—"

"I've met similar cases," said the hypnotist. "Who is the other young man?"

Mwres maintained an appearance of resigned calm. "You may well ask," he said. "He is"—and his voice sank with shame—"a mere attendant upon the stage on which the flying-machines from Paris alight. He has—as they say in the romances—good looks. He is quite young and very eccentric. Affects the antique—he can read and write! So can she. And instead of communicating by telephone, like sensible people, they write and deliver—what is it?"

"Notes?"

"No—not notes. . . . Ah—poems."

The hypnotist raised his eyebrows. "How did she meet him?"

"Tripped coming down from the flying-machine from Paris—and fell into his arms. The mischief was done in a moment!"

"Yes?"

"Well—that's all. Things must be stopped. That is what I want to consult you about. What must be done? What *can* be done? Of course I'm not a hypnotist; my knowledge is limited. But you—?"

"Hypnotism is not magic," said the man in green, putting both arms on the table.

"Oh, precisely! But still—!"

"People cannot be hypnotised without their consent. If she is able to stand out against marrying Bindon, she will probably stand out against being hypnotised. But if once she can be hypnotised—even by somebody else—the thing is done."

"You can—?"

"Oh, certainly! Once we get her amenable, then we can suggest that she *must* marry Bindon—that that is her fate; or that the young man is repulsive, and that when she sees him she will be giddy and faint, or any little thing of that sort. Or if we can get her into a sufficiently profound trance we can suggest that she should forget him altogether—"

"Precisely."

"But the problem is to get her hypnotised. Of course no sort of proposal or suggestion must come from you—because no doubt she already distrusts you in the matter."

The hypnotist leant his head upon his arm and thought.

"IT'S hard a man cannot dispose of his own daughter," said Mwres irrelevantly.

"You must give me the name and address of the young lady," said the hypnotist, "and any information bearing upon the matter. And, by the bye, is there any money in the affair?"

Mwres hesitated.

"There's a sum—in fact, a considerable sum—invested in the Patent Road Company. From her mother. That's what makes the thing so exasperating."

"Exactly," said the hypnotist. And he proceeded to cross-examine Mwres on the entire affair.

It was a lengthy interview.

And meanwhile "Elizebeth Mwres," as she spelt her name, or "Elizabeth Morris" as a nineteenth-century person would have put it, was sitting in a quiet waiting-place beneath the great stage upon which the flying-machine from Paris descended. And beside her sat her slender, handsome lover reading her the poem he had written that morning while on duty upon the stage. When he had finished, they sat for a time in silence; and then, as if for their special entertainment, the great machine that had come flying through the air from America that morning rushed down out of the sky.

At first it was a little oblong; faint and blue amidst the distant fleecy clouds; and then it grew swiftly large and white, and larger and whiter, until they could see the separate tiers of sails, each hundreds of feet wide, and the lank body they supported, and at last even the swinging seats of the passengers in a dotted row. Although it was falling, it seemed to them to be rushing up the sky, and, over the roof-spaces of the city below, its shadow leapt towards them. They heard the whistling rush of the air about it and its yelling siren, shrill and swelling, to warn those who were on its landing-stage of its arrival. And abruptly the note fell down a couple of octaves, and it had passed, and the sky was clear and void, and she could turn her sweet eyes again to Denton at her side.

Their silence ended; and Denton, speaking in a little language of broken English that was, they fancied, their private possession—though lovers have used such little languages since the world began—told her how they too would leap into the air one morning out of all the obstacles and difficulties about them, and fly to a sunlit city of delight he knew of in Japan, half-way about the world.

She loved the dream, but she feared the leap; and she put him off with "Some day, dearest one, some day," to all his pleading that it might be soon; and at last came a shrilling of whistles, and it was time for him to go back to his duties on the stage. They parted—as lovers have been wont to part for thousands of years. She walked down a passage to a lift, and so came to one of the streets of that latter-day London, all glazed in with glass, from the weather, and with incessant moving platforms that went to all parts of the city. And by one of these she returned to her apartments in the Hotel for Women where she lived, the apartments that were in telephonic communication with all the best lecturers in the world. But the sunlight of the flying stage was in her heart, and the wisdom of all the best lecturers in the world seemed folly in that light.

She spent the middle part of the day in the gymnasium, and took her midday meal with two other girls and their common chaperone—for it was still the custom to have a chaperone in the case of motherless girls of the more prosperous classes. The chaperone had a visitor that day, a man in green and yellow, with a white face and vivid eyes, who talked amazingly. Among other things, he fell to praising a new historical romance that one of the great popular story-tellers of the day had just put forth. It was, of course, about the spacious times of Queen Victoria; and the author, among other pleasing novelties, made a little argument before each section of the story, in imitation of the chapter headings of the old-fashioned books; as for example, "How the Cabmen of Pimlico stopped the Victoria Omnibuses, and of the Great Fight in Palace Yard," and "How the Piccadilly Policeman was Slain in the Midst of his Duty." The man in green and yellow praised this innovation. "These pithy sentences," he said, "are admirable. They show at a glance those headlong, tumultuous times, when men and animals jostled in the filthy streets, and death might wait for one at every corner. Life was life then! How great the world must have seemed then! How marvellous! There were still parts of the world absolutely unexplored. Nowadays we have almost abolished wonder; we lead lives so trim and orderly that courage, endurance, faith, all the noble virtues seem fading from mankind."

And so on, taking the girls' thoughts with him, until the life they led, life in the vast and intricate London of the twenty-second century, a life interspersed with soaring excursions to every part of the globe, seemed to them a monotonous misery compared with the dædal past.

At first Elizabeth did not join in the conversation, but after a time the subject became so interesting that she made a few shy interpolations. But he scarcely seemed to notice her as he talked. He went on to describe a new method of entertaining people. They were hypnotised, and then suggestions were made to them so skilfully that they seemed to be living in ancient times again. They played out a little romance in the past as vivid as reality, and when at last they awakened, they remembered all they had been through as though it were a real thing.

"It is a thing we have sought to do for years and years," said the hypnotist. "It is practically an artificial dream. And we know the way at last. Think of all it opens out to us—the enrichment of our experience, the recovery of adventure, the refuge it offers from this sordid, competitive life in which we live! Think!"

"And you can do that!" said the chaperone eagerly.

"The thing is possible at last," the hypnotist said. "You may order a dream as you wish."

The chaperone was the first to be hypnotised, and the dream, she said, was wonderful, when she came to again.

The other two girls, encouraged by her enthusiasm also placed themselves in the hands of the hypnotist and had plunges into the romantic past. No one suggested that Elizabeth should try this novel entertainment; it was at her own request at last that she was taken into that land of dreams where there is neither any freedom of choice nor will. . . .

And so the mischief was done.

ONE day, when Denton went down to that quiet seat beneath the flying stage, Elizabeth was not in her wonted place. He was disappointed, and a

little angry. The next day she did not come, and the next also. He was afraid. To hide his fear from himself, he set to work to write sonnets for her when she should come again . . .

For three days he fought against his dread by such distraction, and then the truth was before him clear and cold, and would not be denied. She might be ill, she might be dead; but he would not believe that he had been betrayed. There followed a week of misery. And then he knew she was the only thing on earth worth having, and that he must seek her, however hopeless the search, until she was found once more.

He had some small private means of his own, and so he threw over his appointment on the flying stage, and set himself to find this girl, who had become at last all the world to him. He did not know where she lived, and little of her circumstances; for it had been part of the delight of her girlish romance that he should know nothing of her, nothing of the difference of their station. The ways of the city opened before him east and west, north and south. Even in Victorian days London was a maze, that little London with its poor four millions of people; but the London he explored, the London of the twenty-second century, was a London of thirty million souls. At first he was energetic and headlong, taking time neither to eat nor sleep. He sought for weeks and months, he went through every imaginable phase of fatigue and despair, over-excitement and anger. Long after hope was dead, by the sheer inertia of his desire, he still went to and fro, peering into faces and looking this way and that, in the incessant ways and lifts and passages of that interminable hive of men.

At last chance was kind to him, and he saw her.

It was in a time of festivity. He was hungry; he had paid the inclusive fee and had gone into one of the gigantic dining-places of the city; he was pushing his way among the tables and scrutinising by mere force of habit every group he passed.

He stood still, robbed of all power of motion, his eyes wide, his lips apart. Elizabeth sat scarcely twenty yards away from him, looking straight at him. Her eyes were as hard to him, as hard and expressionless and void of recognition, as the eyes of a statue.

She looked at him for a moment, and then her gaze passed beyond him.

Had he had only her eyes to judge by he might have doubted if it were indeed Elizabeth, but he knew her by the gesture of her hand, by the grace of a wanton little curl that floated over her ear as she moved her head. Something was said to her, and she turned smiling tolerantly to the man beside her, a little man in foolish raiment knobbed and spiked like some odd reptile with pneumatic horns—the Bindon of her father's choice.

For a moment Denton stood white and wild-eyed; then came a terrible faintness, and he sat before one of the little tables. He sat down with his back to her, and for a time he did not dare to look at her again. When at last he did, she and Bindon and two other people were standing up to go. The others were her father and her chaperone.

He sat as if incapable of action until the four figures were remote and small, and then he rose, possessed with the one idea of pursuit. For a space he feared he had lost them, and then he came upon Elizabeth and her chaperone again in one of the streets of moving platforms that intersected the city. Bindon and Mwres had disappeared.

He could not control himself to patience. He felt he must speak to her forthwith, or die. He pushed forward to where they were seated, and sat down beside them. His white face was convulsed with half-hysterical excitement.

He laid his hand on her wrist. "Elizabeth?" he said.

She turned in unfeigned astonishment. Nothing but the fear of a strange man showed in her face.

"Elizabeth," he cried, and his voice was strange to him: "dearest—you *know* me?"

Elizabeth's face showed nothing but alarm and perplexity. She drew herself away from him. The chaperone, a little grey-headed woman with mobile features, leant forward to intervene. Her resolute bright eyes examined Denton. "*What* do you say?" she asked.

"This young lady," said Denton—"she knows me."

"Do you know him, dear?"

"No," said Elizabeth in a strange voice, and with a hand to her forehead, speaking almost as one who repeats a lesson. "No, I do not know him. I *know* —I do not know him."

"But—but. . . . Not know me! It is I—Denton. Denton! To whom you used to talk. Don't you remember the flying stages? The little seat in the open air? The verses—"

"No," cried Elizabeth,—"no. I do not know him. I do not know him. There is something. . . . But I don't know. All I know is that I do not know him." Her face was a face of infinite distress.

The sharp eyes of the chaperone flitted to and fro from the girl to the man. "You see?" she said, with the faint shadow of a smile. "She does not know you."

"I do not know you," said Elizabeth. "Of that I am sure."

"But, dear—the songs—the little verses—"

"She does not know you," said the chaperone. "You must not. . . . You have made a mistake. You must not go on talking to us after that. You must not annoy us on the public ways."

"But—" said Denton, and for a moment his miserably haggard face appealed against fate.

"You must not persist, young man," protested the chaperone.

"*Elizabeth!*" he cried.

Her face was the face of one who is tormented. "I do not know you," she cried, hand to brow. "Oh, I do not know you!"

For an instant Denton sat stunned. Then he stood up and groaned aloud.

He made a strange gesture of appeal towards the remote glass roof of the public way, then turned and went plunging recklessly from one moving platform to another and vanished amidst the swarms of people going to and fro thereon. The chaperone's eyes followed him, and then she looked at the curious faces about her.

"Dear," asked Elizabeth, clasping her hand, and too deeply moved to heed observation, "who was that man? Who *was* that man?"

The chaperone raised her eyebrows. She spoke in a clear, audible voice. "Some half-witted creature. I have never set eyes on him before."

"Never?"

"Never, dear. Do not trouble your mind about a thing like this."

AND soon after this the celebrated hypnotist who dressed in green and yellow had another client. The young man paced his consulting-room, pale and disordered. "I want to forget," he cried. "I *must* forget."

The hypnotist watched him with quiet eyes, studied his face and clothes and bearing. "To forget anything—pleasure or pain—is to be, by so much—*less*. However, you know your own concern. My fee is high."

"If only I can forget—"

"That's easy enough with you. You wish it. I've done much harder things. Quite recently. I hardly expected to do it; the thing was done against the will of the hypnotised person. A love affair too—like yours. A girl. So rest assured."

The young man came and sat beside the hypnotist. His manner was a forced calm. He looked into the hypnotist's eyes. "I will tell you. Of course you will want to know what it is. There was a girl. Her name was Elizabeth Mwres. Well. . . ."

He stopped. He had seen the instant surprise on the hypnotist's face. In that instant he knew. He stood up. He seemed to dominate the seated figure by his side. He gripped the shoulder of green and gold. For a time he could not find words.

"Give her me back!" he said at last. "Give her me back!"

"What do you mean?" gasped the hypnotist.

"Give her me back."

"Give whom?"

"Elizabeth Mwres—the girl—"

The hypnotist tried to free himself; he rose to his feet. Denton's grip tightened.

"Let go!" cried the hypnotist, thrusting an arm against Denton's chest.

In a moment the two men were locked in a clumsy wrestle. Neither had the slightest training—for athleticism, except for exhibition and to afford opportunity for betting, had faded out of the earth—but Denton was not only the younger but the stronger of the two. They swayed across the room, and then the hypnotist had gone down under his antagonist. They fell together. . . .

Denton leaped to his feet, dismayed at his own fury; but the hypnotist lay still, and suddenly from a little white mark where his forehead had struck a stool shot a hurrying band of red. For a space Denton stood over him irresolute, trembling.

A fear of the consequences entered his gently nurtured mind. He turned towards the door. "No," he said aloud, and came back to the middle of the room. Overcoming the instinctive repugnance of one who had seen no act of violence in all his life before, he knelt down beside his antagonist and felt his heart. Then he peered at the wound. He rose quietly and looked about him. He began to see more of the situation.

When presently the hypnotist recovered his senses, his head ached severely, his back was against Denton's knees and Denton was sponging his face.

The hypnotist did not speak. But presently he indicated by a gesture that in his opinion he had been sponged enough. "Let me get up," he said.

"Not yet," said Denton.

"You have assaulted me, you scoundrel!"

"We are alone," said Denton, "and the door is secure."

There was an interval of thought.

"Unless I sponge," said Denton, "your forehead will develop a tremendous bruise."

"You can go on sponging," said the hypnotist sulkily.

There was another pause.

"We might be in the Stone Age," said the hypnotist. "Violence! Struggle!"

"In the Stone Age no man dared to come between man and woman," said Denton.

The hypnotist thought again.

"What are you going to do?" he asked.

"While you were insensible I found the girl's address on your tablets. I did not know it before. I telephoned. She will be here soon. Then—"

"She will bring her chaperone."

"That is all right."

"But what—? I don't see. What do you mean to do?"

"I looked about for a weapon also. It is an astonishing thing how few weapons there are nowadays. If you consider that in the Stone Age men owned scarcely anything *but* weapons. I hit at last upon this lamp. I have wrenched off the wires and things, and I hold it so." He extended it over the hypnotist's shoulders. "With that I can quite easily smash your skull. I *will*—unless you do as I tell you."

"Violence is no remedy," said the hypnotist, quoting from the "Modern Man's Book of Moral Maxims."

"It's an undesirable disease," said Denton.

"Well?"

"You will tell that chaperone you are going to order the girl to marry that knobby little brute with the red hair and ferrety eyes. I believe that's how things stand?"

"Yes—that's how things stand."

"And, pretending to do that, you will restore her memory of me."

"It's unprofessional."

"Look here! If I cannot have that girl I would rather die than not. I don't propose to respect your little fancies. If anything goes wrong you shall not live five minutes. This is a rude makeshift of a weapon, and it may quite conceivably be painful to kill you. But I will. It is unusual, I know, nowadays to do things like this—mainly because there is so little in life that is worth being violent about."

"The chaperone will see you directly she comes—"

"I shall stand in that recess. Behind you."

The hypnotist thought. "You are a determined young man," he said, "and only half civilized. I have tried to do my duty to my client, but in this affair you seem likely to get your own way. . . ."

"You mean to deal straightly."

"I'm not going to risk having my brains scattered in a petty affair like this."

"And afterwards?"

"There is nothing a hypnotist or doctor hates so much as a scandal. I at least am no savage. I am annoyed. . . . But in a day or so I shall bear no malice. . . ."

"Thank you. And now that we understand each other, there is no necessity to keep you sitting any longer on the floor."

CHAPTER II

The Vacant Country

THE world, they say, changed more between the year 1800 and the year 1900 than it had done in the previous five hundred years. That century, the nineteenth century, was the dawn of a new epoch in the history of mankind—the epoch of the great cities, the end of the old order of country life.

In the beginning of the nineteenth century the majority of mankind still lived upon the countryside, as their way of life had been for countless generations. All over the world they dwelt in little towns and villages then, and engaged either directly in agriculture, or in occupations that were of service to the agriculturist. They travelled rarely, and dwelt close to their work, because swift means of transit had not yet come. The few who travelled went either on foot, or in slow sailing-ships, or by means of jogging horses incapable of more than sixty miles a day. Think of it!—sixty miles a day. Here and there, in those sluggish times, a town grew a little larger than its neighbors, as a port or as a centre of government; but all the towns in the world with more than a hundred thousand inhabitants could be counted on a man's fingers. So it was in the beginning of the nineteenth century. By the end, the invention of railways, telegraphs, steamships, and complex agricultural machinery, had changed all these things; changed them beyond all hope of return. The vast shops, the varied pleasures, the countless conveniences of the larger towns were suddenly possible, and no sooner existed than they were brought into competition with the homely resources of the rural centres. Mankind were drawn to the cities by an overwhelming attraction. The demand for labour fell with the increase of machinery, the local markets were entirely superseded, and there was a rapid growth of the larger centres at the expense of the open country.

The flow of population townward was the constant preoccupation of Victorian writers. In Great Britain and New England, in India and China, the same thing was remarked; everywhere a few swollen towns were visibly replacing the ancient order. That this was an inevitable result of improved means of travel and transport—that, given swift means of transit, these things must be—was realized by few; and the most puerile schemes were devised to overcome the mysterious magnetism of the urban centres, and keep the people on the land.

Yet the developments of the nineteenth century were only the dawning of the new order. The first great cities of the new time were horribly inconvenient, darkened by smoky fogs, insanitary and noisy; but the discovery of new methods of building, new methods of heating, changed all this. Between 1900 and 2000 the march of change was still more rapid; and between 2000 and 2100 the continually accelerated progress of human invention made the reign of Victoria the Good seem at last an almost incredible vision of idyllic tranquil days.

The introduction of railways was only the first step in that development of those means of locomotion which finally revolutionized human life. By the year 2000 railways and roads had vanished together. The railways, robbed of their rails, had become weedy ridges and ditches upon the face of the world; the old roads, strange barbaric tracks of flint and soil, hammered by hand or rolled by rough iron rollers, strewn with miscellaneous filth, and cut by iron hoofs and wheels into ruts and puddles often many inches deep, had been replaced by patent tracks made of a substance called Eadhamite. This Eadhamite—it was named after its patentee—ranks with the invention of printing and steam as one of the epoch-making discoveries of the world's history.

When Eadham discovered the substance, he probably thought of it as a mere cheap substitute for India rubber; it cost a few shillings a ton. But you can never tell all an invention will do. It was the genius of a man named Warming that pointed to the possibility of using it, not only for the tires of wheels, but as a road substance; it was he who organized the enormous network of public ways that speedily covered the world.

These public ways were made with longitudinal divisions. On the outer on either side went foot cyclists and conveyances traveling at a less speed than twenty-five miles an hour; in the middle, motors capable of speed up to a hundred; and the inner, Warming (in the face of enormous ridicule) reserved for vehicles travelling at speeds of a hundred miles an hour and upward.

For ten years his inner ways were vacant. Before he died they were the most crowded of all, and vast light frameworks with wheels of twenty and thirty feet in diameter, hurled along them at paces that year after year rose steadily towards two hundred miles an hour. And by the time this revolution was accomplished, a parallel revolution had transformed the ever-growing cities. Before the development of practical science the fogs and filth of Victorian times vanished. Electric heating replaced fires (in 2013 the lighting of a fire that did not absolutely consume its own smoke was made an indictable nuisance), and all the city ways, all public squares and places, were covered in with a recently invented glass-like substance. The roofing of London became practically continuous. Certain short-sighted and foolish legislation against tall buildings was abolished, and London, from a squat expanse of petty houses—feebly archaic in design—rose steadily towards the sky. To the municipal responsibility for water, light, and drainage, was added another, and that was ventilation.

BUT to tell of all the changes in human convenience that these two hundred years brought about, to tell of the long foreseen invention of flying, to describe how life in households was steadily supplanted by life in interminable hotels, how at last even those who were still concerned in agricultural work came to live in the towns and to go to and fro to their work every day, to describe how at last in all England only four towns remained, each with many millions of people, and how there were left no inhabited houses in all the countryside; to tell all this would take us far from our story of Denton and his Elizabeth. They had been separated and reunited, and still they could not marry. For Denton—it was his only fault—had no money. Neither had Elizabeth until she was twenty-one, and as yet she was only eighteen. At twenty-one, all the property of her mother would come to her, for that was the custom of the time. She did not know that it was possible to anticipate her fortune, and Denton was far too delicate a lover to suggest such a thing. So

things stuck hopelessly between them. Elizabeth said that she was very unhappy, and that nobody understood her but Denton, and that when she was away from him she was wretched; and Denton said that his heart longed for her day and night. And they met as often as they could to enjoy the discussion of their sorrows.

They met one day at their little seat upon the flying stage. The precise site of this meeting was where in Victorian times the road from Wimbledon came out upon the common. They were, however, five hundred feet above that point. Their seat looked far over London. To convey the appearance of it all to a nineteenth-century reader would have been difficult. One would have had to tell him to think of the Crystal Palace, of the newly built "mammoth" hotels—as those little affairs were called—of the larger railway stations of his time, and to imagine such buildings enlarged to vast proportions and run together and continuous over the whole metropolitan area. If then he was told that this continuous roof-space bore a huge forest of rotating wind-wheels, he would have begun very dimly to appreciate what to these young people was the commonest sight in their lives.

To their eyes it had something of the quality of a prison, and they were talking, as they had talked a hundred times before, of how they might escape from it and be at last happy together: escape from it, that is, before the appointed three years were at an end. It was, they both agreed, not only impossible but almost wicked, to wait three years. "Before that," said Denton—and the notes of his voice told of a splendid chest—*"we might both be dead!"*

Their vigorous young hands had to grip at this, and then Elizabeth had a still more poignant thought that brought the tears from her wholesome eyes and down her healthy cheeks. *"One* of us," she said, *"one* of us might be—"

She choked; she could not say the word that is so terrible to the young and happy.

Yet to marry and be very poor in the cities of that time was—for any one who had lived pleasantly—a very dreadful thing. In the old agricultural days that had drawn to an end in the eighteenth century there had been a pretty proverb of love in a cottage; and indeed in those days the poor of the countryside had dwelt in flower-covered, diamond-windowed cottages of thatch and plaster, with the sweet air and earth about them, amidst tangled hedges and the song of birds, and with the ever-changing sky overhead. But all this had changed (the change was already beginning in the nineteenth century), and a new sort of life was opening for the poor—in the lower quarters of the city.

In the nineteenth century the lower quarters were still beneath the sky; they were areas of land on clay or other unsuitable soil, liable to floods or exposed to the smoke of more fortunate districts, insufficiently supplied with water, and as insanitary as the great fear of infectious diseases felt by the wealthier classes permitted. In the twenty-second century, however, the growth of the city story above story, and the coalescence of buildings, had led to a different arrangement. The prosperous people lived in a vast series of sumptuous hotels in the upper storeys and halls of the city fabric; the industrial population dwelt beneath in the tremendous ground-floor and basement, so to speak, of the place.

IN the refinement of life and manners these lower classes differed little from their ancestors, the East-enders of Queen Victoria's time; but they had developed a distinct dialect of their own. In these under ways they lived and died, rarely ascending to the surface except when work took them there. Since for most of them this was the sort of life to which they had been born, they found no great misery in such circumstances; but for people like Denton and Elizabeth, such a plunge would have seemed more terrible than death.

"And yet what else is there?" asked Elizabeth.

Denton professed not to know. Apart from his own feeling of delicacy, he was not sure how Elizabeth would like the idea of borrowing on the strength of her expectations.

The passage from London to Paris even, said Elizabeth, was beyond their means; and in Paris, as in any other city in the world, life would be just as costly and impossible as in London.

Well might Denton cry aloud: "If only we had lived in those days, dearest! If only we had lived in the past!" For to their eyes even nineteenth-century Whitechapel was seen through a mist of romance.

"Is there *nothing?"* cried Elizabeth, suddenly weeping. "Must we really wait for those three long years? Fancy *three* years—six-and-thirty months." The human capacity for patience had not grown with the ages.

Then suddenly Denton was moved to speak of something that had already flickered across his mind. He had hit upon it at last. It seemed to him so wild a suggestion that he made it only half seriously. But to put a thing into words has ever a way of making it seem more real and possible than it seemed before. And so it was with him.

"Suppose," he said, "we went into the country?"

She looked at him to see if he was serious in proposing such an adventure.

"The country?"

"Yes—beyond there. Beyond the hills."

"How could we live?" she said. *"Where* could we live?"

"It is not impossible," he said. "People used to live in the country."

"But then there were houses."

"There are the ruins of villages and towns now. On the clay lands they are gone, of course. But they are still left on the grazing land, because it does not pay the Food Company to remove them. I know that—for certain. Besides, one sees them from the flying machines, you know. Well, we might shelter in some one of these, and repair it with our hands. Do you know, the thing is not so wild as it seems. Some of the men who go out every day to look after the crops and herds might be paid to bring us food. . . ."

She stood in front of him. "How strange it would be if one really could . . ."

"Why not?"

"But no one dares."

"That is no reason."

"It would be—oh! it would be so romantic and strange. If only it were possible."

"Why not possible?"

"There are so many things. Think of all the things we have, things that we should miss."

"Should we miss them? After all, the life we lead is very unreal—very artificial." He began to ex-

pand his idea, and as he warmed to his exposition the fantastic quality of his first proposal faded away.

She thought. "But I have heard of prowlers—escaped criminals."

He nodded. He hesitated over his answer because he thought it sounded boyish. He blushed. "I could get some one I know to make me a sword."

She looked at him with enthusiasm growing in her eyes. She had heard of swords, had seen one in a museum; she thought of those ancient days when men wore them as a common thing. His suggestion seemed an impossible dream to her, and perhaps for that reason she was eager for more detail. And inventing for the most part as he went along, he told her, how they might live in the country as the old-world people had done. With every detail her interest grew, for she was one of those girls for whom romance and adventure have a fascination.

His suggestion seemed, I say, an impossible dream to her on that day, but the next day they talked about it again, and it was strangely less impossible.

"At first we should take food," said Denton. "We could carry food for ten or twelve days." It was an age of compact artificial nourishment, and such a provision had none of the unwieldy suggestion it would have had in the nineteenth century.

"But—until our house," she asked—"until it was ready, where should we sleep?"

"It is summer."

"But. . . . What do you mean?"

"There was a time when there were no houses in the world; when all mankind slept always in the open air."

"But for us! The emptiness! No walls—no ceiling!"

"Dear," he said, "in London you have many beautiful ceilings. Artists paint them and stud them with lights. But I have seen a ceiling more beautiful than any in London. . . ."

"But where?"

"It is the ceiling under which we two would be alone . . ."

"You mean. . . .?"

"Dear," he said, "it is something the world has forgotten. It is Heaven and all the host of stars."

EACH time they talked the thing seemed more possible and more desirable to them. In a week or so it was quite possible. Another week, and it was the inevitable thing they had to do. A great enthusiasm for the country seized hold of them and possessed them. The sordid tumult of the town, they said, overwhelmed them. They marvelled that this simple way out of their troubles had never come upon them before.

One morning near Midsummer-day, there was a new minor official upon the flying stage, and Denton's place was to know him no more.

Our two young people had secretly married, and were going forth manfully out of the city in which they and their ancestors before them had lived all their days. She wore a new dress of white cut in an old-fashioned pattern, and he had a bundle of provisions strapped athwart his back, and in his hand he carried—rather shame-facedly it is true, and under his purple cloak—an implement of archaic form, a cross-hilted thing of tempered steel.

Imagine that going forth! In their days the sprawling suburbs of Victorian times with their vile roads, petty houses, foolish little gardens of shrub and geranium, and all their futile, pretentious privacies had disappeared; the towering buildings of the new age, the mechanical ways, the electric and water mains, all came to an end together like a wall, like a cliff, near four hundred feet in height, abrupt and sheer. All about the city spread the carrot, swede, and turnip fields of the Food Company, vegetables that were the basis of a thousand varied foods, and weeds and hedgerow tangles had been utterly extirpated. The incessant expense of weeding that went on year after year in the petty, wasteful and barbaric farming of the ancient days, the Food Company had economised for ever more by a campaign of extermination. Here and there, however, neat rows of bramble standards and apple trees with whitewashed stems, intersected the fields, and at places groups of gigantic teazles reared their favoured spikes. Here and there huge agricultural machines hunched under waterproof covers. The mingled waters of the Wey and Mole and Wandle ran in rectangular channels; and wherever a gentle elevation of the ground permitted a fountain of deodorised sewage distributed its benefits athwart the land and made a rainbow of the sunlight.

By a great archway in that enormous city wall emerged the Eadhamite road to Portsmouth, swarming in the morning sunshine with an enormous traffic bearing the blue-clad servants of the Food Company to their toil. A rushing traffic, beside which they seemed two scarce-moving dots. Along the outer tracks hummed and rattled the tardy little old-fashioned motors of such as had duties within twenty miles or so of the city; the inner ways were filled with vaster mechanisms—swift monocycles bearing a score of men, lank multicycles, quadricycles sagging with heavy loads, empty gigantic produce carts that would come back again filled before the sun was setting, all with throbbing engines and noiseless wheels and a perpetual wild melody of horns and gongs.

Along the very verge of the outermost way our young people went in silence, newly wed and oddly shy of one another's company. Many were the things shouted to them as they tramped along, for in 2100 a foot-passenger on an English road was almost as strange a sight as a motor car would have been in 1800. But they went on with steadfast eyes into the country, paying no heed to such cries.

Before them in the south rose the Downs, blue at first, and as they came nearer, changing to green, surmounted by the row of gigantic wind-wheels that supplemented the wind-wheels upon the roof-spaces of the city, and broken and restless with the long morning shadows of those whirling vanes. By midday they had come so near that they could see here and there little patches of pallid dots—the sheep the Meat Department of the Food Company owned. In another hour they had passed the clay and the root crops and the single fence that hedged them in, and the prohibition against trespass no longer held: the levelled roadway plunged into a cutting with all its traffic, and they could leave it and walk over the greensward and up the open hillside.

Never had these children of the latter days been together in such a lonely place.

They were both very hungry and footsore—for walking was a rare exercise—and presently they sat down on the weedless, close-cropped grass, and looked back for the first time at the city from which they had come, shining wide and splendid in the blue

haze of the valley of the Thames. Elizabeth was a little afraid of the unenclosed sheep away up the slope—she had never been near big unrestrained animals before—but Denton reassured her. And overhead a white-winged bird circled in the blue.

They talked but little until they had eaten, and then their tongues were loosened. He spoke of the happiness that was now certainly theirs, of the folly of not breaking sooner out of the magnificent prison of latter-day life, of the old romantic days that had passed from the world for ever. And then he became boastful. He took up the sword that lay on the ground beside him, and she took it from his hand and ran a tremulous finger along the blade.

"And you could," she said, "*you*—could raise this and strike a man?"

"Why not? If there were need."

"But," she said, "it seems so horrible. It would slash . . . There would be"—her voice sank,—"*blood.*"

"In the old romances you have read often enough . . ."

"Oh, I know: in those—yes. But that is different. One knows it is not blood, but just a sort of red ink . . . And *you*—killing!"

She looked at him doubtfully, and then handed him back the sword.

AFTER they had rested and eaten, they rose up and went on their way towards the hills. They passed quite close to a huge flock of sheep, who stared and bleated at their unaccustomed figures. She had never seen sheep before, and she shivered to think such gentle things must needs be slain for food. A sheep-dog barked from a distance, and then a shepherd appeared amidst the supports of the wind-wheels, and came down towards them.

When he drew near he called out asking whither they were going.

Denton hesitated, and told him briefly that they sought some ruined house among the Downs, in which they might live together. He tried to speak in an off-hand manner, as though it was a usual thing to do. The man stared incredulously.

"Have you *done* anything?" he asked.

"Nothing," said Denton. "Only we don't want to live in a city any longer. Why should we live in cities?"

The shepherd stared more incredulously than ever. "You can't live here," he said.

"We mean to try."

The shepherd stared from one to the other. "You'll go back to-morrow," he said. "It looks pleasant enough in the sunlight. . . . Are you sure you've done nothing? We shepherds are not such *great* friends of the police."

Denton looked at him steadfastly. "No," he said. "But we are too poor to live in the city, and we can't bear the thought of wearing clothes of blue canvas and doing drudgery. We are going to live a simple life here, like the people of old."

The shepherd was a bearded man with a thoughtful face. He glanced at Elizabeth's fragile beauty.

"*They* had simple minds," he said.

"So have we," said Denton.

The shepherd smiled.

"If you go along here," he said, "along the crest beneath the wind-wheels, you will see a heap of mounds and ruins on your right-hand side. That was once a town called Epsom. There are no houses there, and the bricks have been used for a sheep pen. Go on, and another heap on the edge of the root-land is Leatherhead; and then the hill turns away along the border of a valley, and there are woods of beech. Keep along the crest. You will come to quite wild places. In some parts, in spite of all the weeding that is done, ferns and bluebells and other such useless plants are growing still. And through it all underneath the wind-wheels runs a straight lane paved with stones, a roadway of the Romans two thousand years old. Go to the right of that, down into the valley and follow it along by the banks of the river. You come presently to a street of houses, many with the roofs still sound upon them. There you may find shelter.

They thanked him.

"But it's a quiet place. There is no light after dark there, and I have heard tell of robbers. It is lonely. Nothing happens there. The phonographs of the story-tellers, the kinematograph entertainments, the news machines—none of them are to be found there. If you are hungry there is no food, if you are ill no doctor. . . ." He stopped.

"We shall try it," said Denton, moving to go on. Then a thought struck him, and he made an agreement with the shepherd, and learnt where they might find him, to buy and bring them anything of which they stood in need, out of the city.

AND in the evening they came to the deserted village, with its houses that seemed so small and odd to them: they found it golden in the glory of the sunset, and desolate and still. They went from one deserted house to another, marvelling at their quaint simplicity, and debating which they should choose. And at last, in a sunlit corner of a room that had lost its outer wall, they came upon a wild flower, a little flower of blue that the weeders of the Food Company had overlooked.

That house they decided upon; but they did not remain in it long that night, because they were resolved to feast upon nature. And moreover the houses became very gaunt and shadowy after the sunlight had faded out of the sky. So after they had rested a little time they went to the crest of the hill again to see with their own eyes the silence of heaven set with stars, about which the old poets had had so many things to tell. It was a wonderful sight, and Denton talked like the stars, and when they went down the hill at last the sky was pale with dawn. They slept but little, and in the morning when they woke a thrush was singing in a tree.

So these young people of the twenty-second century began their exile. That morning they were very busy exploring the resources of this new home in which they were going to live the simple life. They did not explore very fast or very far, because they went everywhere hand-in-hand; but they found the beginnings of some furniture. Beyond the village was a store of winter fodder for the sheep of the Food Company, and Denton dragged great armfuls to the house to make a bed; and in several of the houses were old fungus-eaten chairs and tables—rough, barbaric, clumsy furniture, it seemed to them, and made of wood. They repeated many of the things they had said on the previous day, and towards evening they found another flower, a harebell. In the late afternoon some Company shep-

herds went down the river valley riding on a big multicycle; but they hid from them, because their presence, Elizabeth said, seemed to spoil the romance of this old-world place altogether.

In this fashion they lived a week. For all that week the days were cloudless, and the nights, nights of starry glory, that were invaded each a little more by a crescent moon.

Yet something of the first splendour of their coming faded—faded imperceptibly day after day; Denton's eloquence became fitful, and lacked fresh topics of inspiration; the fatigue of their long march from London told in a certain stiffness of the limbs, and each suffered from a slight unaccountable cold. Moreover, Denton became aware of unoccupied time. In one place among the carelessly heaped lumber of the old times he found a rust-eaten spade, and with this he made a fitful attack on the razed and grass-grown garden—though he had nothing to plant or sow. He returned to Elizabeth with a sweat-streaming face, after half an hour of such work.

"There were giants in those days," he said, not understanding what wont and training will do. And their walk that day led them along the hills until they could see the city shimmering far away in the valley. "I wonder how things are going on there," he said.

And then came a change in the weather. "Come out and see the clouds," she cried; and behold! they were a sombre purple in the north and east, streaming up to ragged edges at the zenith. And as they went up the hill these hurrying streamers blotted out the sunset. Suddenly the wind set the beech-trees swaying and whispering, and Elizabeth shivered. And then far away the lightning flashed, flashed like a sword that is drawn suddenly, and the distant thunder marched about the sky, and even as they stood astonished, pattering upon them came the first headlong raindrops of the storm. In an instant the last streak of sunset was hidden by a falling curtain of hail, and the lightning flashed again, and the voice of the thunder roared louder, and all about them the world scowled dark and strange.

Seizing hands, these children of the city ran down the hill to their home, in infinite astonishment. And ere they reached it, Elizabeth was weeping with dismay, and the darkling ground about them was white and brittle and active with the pelting hail.

Then began a strange and terrible night for them. For the first time in their civilised lives they were in absolute darkness; they were wet and cold and shivering, all about them hissed the hail, and through the long neglected ceilings of the derelict home came noisy spouts of water and formed pools and rivulets on the creaking floors. As the gusts of the storm struck the worn-out building, it groaned and shuddered, and now a mass of plaster from the wall would slide and smash, and now some loosened tile would rattle down the roof and crash into the empty greenhouse below. Elizabeth shuddered, and was still; Denton wrapped his gay and flimsy city cloak about her, and so they crouched in the darkness. And ever the thunder broke louder and nearer, and ever more lurid flashed the lightning, jerking into a momentary gaunt clearness the steaming, dripping room in which they sheltered.

Never before had they been in the open air save when the sun was shining. All their time had been spent in the warm and airy ways and halls and rooms of the latter-day city. It was to them that night as if they were in some other world, some disordered chaos of stress and tumult, and almost beyond hoping that they should ever see the city ways again.

The storm seemed to last interminably, until at last they dozed between the thunderclaps, and then very swiftly it fell and ceased. And as the last patter of the rain died away they heard an unfamiliar sound.

"WHAT is that?" cried Elizabeth.

It came again. It was the barking of dogs. It drove down the desert lane and passed; and through the window, whitening the wall before them and throwing upon it the shadow of the window-frame and of a tree in black silhouette, shone the light of the waxing moon. . . .

Just as the pale dawn was drawing the things about them into sight, the fitful barking of dogs came near again, and stopped. They listened. After a pause they heard the quick pattering of feet seeking round the house, and short, half-smothered barks. Then again everything was still.

"Ssh!" whispered Elizabeth, and pointed to the door of their room.

Denton went half-way towards the door, and stood listening. He came back with a face of affected unconcern. "They must be the sheep-dogs of the Food Company," he said. "They will do us no harm."

He sat down again beside her. "What a night it has been!" he said, to hide how keenly he was listening.

"I don't like dogs," answered Elizabeth, after a long silence.

"Dogs never hurt any one," said Denton. "In the old days—in the nineteenth century—everybody had a dog."

"There was a romance I heard once. A dog killed a man."

"Not this sort of dog," said Denton confidently. "Some of those romances—are exaggerated."

Suddenly a half bark and a pattering up the staircase; the sound of panting. Denton sprang to his feet and drew the sword out of the damp straw upon which they had been lying. Then in the doorway appeared a gaunt sheep-dog, and halted there. Behind it stared another. For an instant man and brute faced each other, hesitating.

Then Denton, being ignorant of dogs, made a sharp step forward. "Go away," he said, with a clumsy motion of his sword.

The dog started and growled. Denton stopped sharply. "Good dog!" he said.

The growling jerked into a bark.

"Good dog!" said Denton. The second dog growled and barked. A third out of sight down the staircase took up the barking also. Outside others gave tongue—a large number, it seemed to Denton.

"This is annoying," said Denton, without taking his eye off the brutes before him. "Of course the shepherds won't come out of the city for hours yet. Naturally these dogs don't quite make us out."

"I can't hear!" shouted Elizabeth. She stood up and came to him.

Denton tried again, but the barking still drowned his voice. The sound had a curious effect upon his blood. Odd disused emotions began to stir; his face

changed as he shouted. He tried again; the barking seemed to mock him, and one dog danced a pace forward, bristling. Suddenly he turned, and uttering certain words in the dialect of the underways, words incomprehensible to Elizabeth, he made for the dogs. There was a sudden cessation of the barking, a growl and a snapping. Elizabeth saw the snarling head of the foremost dog, its white teeth and retracted ears, and the flash of the thrust blade. The brute leapt into the air and was flung back.

Then Denton, with a shout, was driving the dogs before him. The sword flashed above his head with a sudden new freedom of gesture, and then he vanished down the staircase. She made six steps to follow him, and on the landing there was blood. She stopped, and hearing the tumult of dogs and Denton's shouts pass out of the house, ran to the window.

Nine wolfish sheep-dogs were scattering, one writhed before the porch; and Denton, tasting that strange delight of combat that slumbers still in the blood of even the most civilized man, was shouting and running across the garden space. And then she saw something that for a moment he did not see. The dogs circled round this way and that, and came again. They had him in the open.

In an instant she divined the situation. She would have called to him. For a moment she felt sick and helpless, and then, obeying a strange impulse, she gathered up her white skirt and ran downstairs. In the hall was the rusting spade. That was it! She seized it and ran out.

She came none too soon. One dog rolled before him, well-nigh slashed in half; but a second had him by the thigh, a third gripped his collar behind, and a fourth had the blade of the sword between its teeth, tasting its own blood. He parried the leap of a fifth with his left arm.

It might have been the first century instead of the twenty-second, so far as she was concerned. All the gentleness of her eighteen years of city life vanished before the primordial need. The spade smote hard and sure, and cleft a dog's skull. Another, crouching for a spring, yelped with dismay at this unexpected antagonist, and rushed aside. Two wasted precious moments on the binding of a feminine skirt.

The collar of Denton's cloak tore and parted as he staggered back; and that dog too felt the spade, and ceased to trouble him. He sheathed his sword in the brute at his thigh.

"To the wall!" cried Elizabeth; and in three seconds the fight was at an end, and our young people stood side by side, while a remnant of five dogs, with ears and tails of disaster, fled shamefully from the stricken field.

For a moment they stood panting and victorious, and then Elizabeth, dropping her spade, covered her face, and sank to the ground in a paroxysm of weeping. Denton looked about him, thrust the point of his sword into the ground so that it was at hand, and stooped to comfort her.

AT last their more tumultuous emotions subsided, and they could talk again. She leant upon the wall, and he sat upon it so that he could keep an eye open for any returning dogs. Two, at any rate, were up on the hillside and keeping up a vexatious barking.

She was tear-stained, but not very wretched now, because for half an hour he had been repeating that she was brave and had saved his life. But a new fear was growing in her mind.

"They are the dogs of the Food Company," she said. "There will be trouble."

"I am afraid so. Very likely they will prosecute us for trespass."

A pause.

"In the old times," he said, "this sort of thing happened day after day."

"Last night!" she said. "I could not live through another such night."

He looked at her. Her face was pale for want of sleep, and drawn and haggard. He came to a sudden resolution. "We must go back," he said.

She looked at the dead dogs, and shivered. "We cannot stay here," she said.

"We must go back," he repeated, glancing over his shoulder to see if the enemy kept their distance. "We have been happy for a time. . . . But the world is too civilized. Ours is the age of cities. More of this will kill us."

"But what are we to do? How can we live there?"

Denton hesitated. His heel kicked against the wall on which he sat. "It's a thing I haven't mentioned before," he said, and coughed; "but . . ."

"Yes?"

"You could raise money on your expectations," he said.

"Could I?" she said eagerly.

"Of course you could. What a child you are!"

She stood up, and her face was bright. "Why did you not tell me before?" she asked. "And all this time we have been here!"

He looked at her for a moment, and smiled. Then the smile vanished. "I thought it ought to come from you," he said. "I didn't like to ask for your money. And besides—at first I thought this would be rather fine."

There was a pause.

"It *has* been fine," he said; and glanced once more over his shoulder. "Until all this began."

"Yes," she said, "those first days. The first three days."

They looked for a space into one another's faces, and then Denton slid down from the wall and took her hand.

"To each generation," he said, "the life of its time. I see it all plainly now. In the city—that is the life to which we were born. To live in any other fashion. . . . Coming here was a dream, and this—is the awakening."

"It was a pleasant dream," she said,—"in the beginning."

For a long space neither spoke.

"If we would reach the city before the shepherds come here, we must start," said Denton. "We must get our food out of the house and eat as we go."

Denton glanced about him again, and, giving the dead dogs a wide berth, they walked across the garden space and into the house together. They found the wallet with their food, and descended the blood-stained stairs again. In the hall Elizabeth stopped. "One minute," she said. "There is something here."

She led the way into the room in which that one little blue flower was blooming. She stooped to it, she touched it with her hand.

"I want it," she said; and then, "I cannot take it. . . ."

Impulsively she stooped and kissed its petals.

Then silently, side by side, they went across the

empty garden-space into the old high road, and set their faces resolutely towards the distant city—towards the complex mechanical city of those latter days, the city that had swallowed up mankind.

CHAPTER III

The Ways of the City

PROMINENT if not paramount among world-changing inventions in the history of man is that series of contrivances in locomotion that began with the railway and ended for a century or more with the motor and the patent road. That these contrivances, together with the device of limited liability joint stock companies and the supersession of agricultural laborers by skilled men with ingenious machinery, would necessarily concentrate mankind in cities of unparalleled magnitude and work an entire revolution in human life, became, after the event, a thing so obvious that it is a matter of astonishment it was not more clearly anticipated. Yet that any steps should be taken to anticipate the miseries such a revolution might entail does not appear even to have been suggested; and the idea that the moral prohibitions and sanctions, the privileges and concessions, the conception of property and responsibility, of comfort and beauty, that had rendered the mainly agricultural states of the past prosperous and happy, would fail in the rising torrent of novel opportunities and novel stimulations, never seems to have entered the nineteenth-century mind. That a citizen, kindly and fair in his ordinary life, could as a shareholder become almost murderously greedy; that commercial methods that were reasonable and honorable on the old-fashioned countryside, should on an enlarged scale be deadly and overwhelming; that ancient charity was modern pauperization, and ancient employment modern sweating; that, in fact, a revision and enlargement of the duties and rights of man had become urgently necessary, were things it could not entertain, nourished as it was on an archaic system of education and profoundly restrospective and legal in all its habits of thought. It was known that the accumulation of men in cities involved unprecedented dangers of pestilence; there was an energetic development of sanitation; but that the diseases of gambling and usury, of luxury and tyranny should become endemic, and produce horrible consequences was beyond the scope of nineteenth-century thought. And so, as if it were some inorganic process, practically unhindered by the creative will of man, the growth of the swarming unhappy cities that mark the twenty-first century accomplished itself.

The new society was divided into three main classes. At the summit slumbered the property owner, enormously rich by accident rather than design, potent save for the will and aim, the last *avatar* of Hamlet in the world. Below was the enormous multitude of workers employed by the gigantic companies that monopolized control; and between these two the dwindling middle class, officials of innumerable sorts, foremen, managers, the medical, legal, artistic, and scholastic classes, and the minor rich, a middle class whose members led a life of insecure luxury and precarious speculation amidst the movements of the great managers.

Already the love story and the marrying of two persons of this middle class have been told: how they overcame the obstacles between them, and how they tried the simple old-fashioned way of living on the countryside and came back speedily enough into the city of London. Denton had no means, so Elizabeth borrowed money on the securities that her father Mwres held in trust for her until she was one-and-twenty.

The rate of interest she paid was of course high, because of the uncertainty of her security, and the arithmetic of lovers is often sketchy and optimistic. Yet they had very glorious times after that return. They determined they would not go to a Pleasure city nor waste their days rushing through the air from one part of the world to the other, for in spite of one disillusionment, their tastes were still old-fashioned. They furnished their little room with quaint old Victorian furniture, and found a shop on the forty-second floor in Seventh Way, where printed books of the old sort were still to be bought. It was their pet affectation to read print instead of hearing phonographs. And when presently there came a sweet little girl, to unite them further if it were possible, Elizabeth would not send it to a *Crèche*, as the custom was, but insisted on nursing it at home. The rent of their apartments was raised on account of this singular proceeding, but that they did not mind. It only meant borrowing a little more.

Presently Elizabeth was of age, and Denton had a business interview with her father that was not agreeable. An exceedingly disagreeable interview with their money-lender followed, from which he brought home a white face. On his return Elizabeth had to tell him of a new and marvelous intonation of "Goo" that their daughter had devised, but Denton was inattentive. In the midst, just as she was at the cream of her description, he interrupted. "How much money do you think we have left, now that everything is settled?"

She stared and stopped her appreciative swaying of the Goo genius that had accompanied her description.

"You don't mean . . .?"

"Yes," he answered. "Ever so much. We have been wild. It's the interest. Or something. And the shares you had, slumped. Your father did not mind. Said it was not his business, after what had happened. He's going to marry again. . . . Well—we have scarcely a thousand left!"

"Only a thousand?"

"Only a thousand."

And Elizabeth sat down. For a moment she regarded him with a white face, then her eyes went about the quaint, old-fashioned room, with its middle Victorian furniture and genuine oleographs, and rested at last on the little lump of humanity within her arms.

DENTON glanced at her and stood downcast. Then he swung round on his heel and walked up and down very rapidly.

"I must get something to do," he broke out presently. "I am an idle scoundrel. I ought to have thought of this before. I have been a selfish fool. I wanted to be with you all day . . ."

He stopped, looking at her white face. Suddenly he came and kissed her and the little face that nestled against her breast.

"It's all right, dear," he said, standing over her; "you won't be lonely now—now Dings is beginning to talk to you. And I can soon get something to do,

you know. Soon . . . Easily . . . It's only a shock at first. But it will come all right. It's sure to come right. I will go out again as soon as I have rested, and find what can be done. For the present it's hard to think of anything . . ."

"It would be hard to leave these rooms," said Elizabeth; "but—"

"There won't be any need of that—trust me."

"They are expensive."

Denton waved that aside. He began talking of the work he could do. He was not very explicit what it would be; but he was quite sure that there was something to keep them comfortably in the happy middle class, whose way of life was the only one they knew.

"There are three-and-thirty million people in London," he said: "some of them *must* have need of me."

"Some *must*."

"The trouble is . . . Well—Bindon, that brown little old man your father wanted you to marry. He's an important person. . . . I can't go back to my flying-stage work, because he is now a Commissioner of the Flying Stage Clerks."

"I didn't know that," said Elizabeth.

"He was made that in the last few weeks . . . or things would be easy enough, for they liked me on the flying stage. But there's dozens of other things to be done—dozens. Don't you worry, dear. I'll rest a little while, and then we'll dine, and then I'll start on my rounds. I know lots of people—lots."

So they rested, and then they went to the public dining-room and dined, and then he started on his search for employment. But they soon realized that in the matter of one convenience the world was just as badly off as it had ever been, and that was a nice, secure, honorable, remunerative employment, leaving ample leisure for the private life, and demanding no special ability, no violent exertion or risk, and no sacrifice of any sort for its attainment. He evolved a number of brilliant projects, and spent many days hurrying from one part of the enormous city to another in search of influential friends; and all his influential friends were glad to see him, and very sanguine until it came to definite proposals, and then they became guarded and vague. He would part with them coldly, and think over their behavior, and get irritated on his way back, and stop at some telephone office and spend money on an animated but unprofitable quarrel. And as the days passed, he got so worried and irritated that even to seem kind and careless before Elizabeth cost him an effort—as she, being a loving woman, perceived very clearly.

After an extremely complex preface one day, she helped him out with a painful suggestion. He had expected her to weep and give way to despair when it came to selling all their joyfully bought early Victorian treasures, their quaint objects of art, their antimacassars, bead mats, repp curtains, veneered furniture, gold-framed steel engravings and pencil drawings, wax flowers under shades, stuffed birds, and all sorts of choice old things; but it was she who made the proposal. The sacrifice seemed to fill her with pleasure, and so did the idea of shifting to apartments ten or twelve floors lower in another hotel. "So long as Dings is with us, nothing matters," she said. "It's all experience." So he kissed her, said she was braver than when she fought the sheep-dogs, called her Boadicea, and abstained very carefully from reminding her that they would have to pay a considerably higher rent on account of the little voice with which Dings greeted the perpetual uproar of the city.

His idea had been to get Elizabeth out of the way when it came to selling the absurd furniture about which their affections were twined and tangled; but when it came to the sale it was Elizabeth who haggled with the dealer while Denton went about the running ways of the city, white and sick with sorrow and the fear of what was still to come. When they moved into their sparsely furnished pink-and-white apartments in a cheap hotel, there came an outbreak of furious energy on his part, and then nearly a week of lethargy during which he sulked at home. Through those days Elizabeth shone like a star, and at the end Denton's misery found a vent in tears. And then he went out into the city ways again, and—to his utter amazement—found some work to do.

His standard of employment had fallen steadily until at last it had reached the lowest level of independent workers. At first he had aspired to some high official position in the great Flying or Windvane or Water Companies, or to an appointment on one of the General Intelligence Organizations that had replaced newspapers, or to some professional partnership, but those were the dreams of the beginning. From that he had passed to speculation, and three hundred gold "lions" out of Elizabeth's thousand had vanished one evening in the share market. Now he was glad his good looks secured him a trial in the position of salesman to the Suzannah Hat Syndicate, a Syndicate dealing in ladies' caps, hair decorations, and hats—for though the city was completely covered in, ladies still wore extremely elaborate and beautiful hats at the theatres and places of public worship.

IT would have been amusing if one could have confronted a Regent Street shopkeeper of the nineteenth century with the development of his establishment in which Denton's duties lay. Nineteenth Way was still sometimes called Regent Street, but it was now a street of moving platforms and nearly eight hundred feet wide. The middle space was immovable and gave access by staircases descending into subterranean ways to the houses on either side. Right and left were an ascending series of continuous platforms each of which traveled about five miles an hour faster than the one internal to it, so that one could step from platform to platform until one reached the swiftest outer way and so go about the city. The establishment of the Suzannah Hat Syndicate projected a vast *facade* upon the outer way, sending out overhead at either end an overlapping series of huge white glass screens, on which gigantic animated pictures of the faces of well-known beautiful living women wearing novelties in hats were thrown. A dense crowd was always collected in the stationary central way watching a vast kinematograph which displayed the changing fashion. The whole front of the building was in perpetual chromatic change, and all down the *facade*—four hundred feet it measured—and all across the street of moving ways, laced and winked and glittered in a thousand varieties of color and lettering the inscription—

SUZANNA! 'ETS! SUZANNA! 'ETS!

A broadside of gigantic phonographs drowned all conversation in the moving way and roared *"hats"*

at the passer-by, while far down the street and up, other batteries counseled the public to "walk down for Suzannah," and queried, "Why *don't* you buy the girl a hat?"

For the benefit of those who chanced to be deaf —and deafness was not uncommon in the London of that age, inscriptions of all sizes were thrown from the roof above upon the moving platforms themselves, and on one's hand or on the bald head of the man before one, or on a lady's shoulders, or in a sudden jet of flame before one's feet, the moving finger wrote in unanticipated letters of fire *"ets r chip t'de,"* or simply *"ets."* And despite all these efforts so high was the pitch at which the city lived, so trained became one's eyes and ears to ignore all sorts of advertisement, that many a citizen had passed that place thousands of times and was still unaware of the existence of the Suzannah Hat Syndicate.

To enter the building one descended the staircase in the middle way and walked through a public passage in which pretty girls promenaded, girls who were willing to wear a ticketed hat for a small fee. The entrance chamber was a large hall in which wax heads fashionably adorned rotated gracefully upon pedestals, and from this one passed through a cash office to an interminable series of little rooms, each with its salesman, its three or four hats and pins, its mirrors, its kinematographs, telephones and hat slides in communication with the central depot, its comfortable lounge and tempting refreshments. A salesman in such an apartment did Denton now become. It was his business to attend to any of the incessant stream of ladies who chose to stop with him, to behave as winningly as possible, to offer refreshment, to converse on any topic the possible customer chose, and to guide the conversation dexterously but not insistently towards hats. He was to suggest trying on various types of hat and to show by his manner and bearing, but without any coarse flattery, the enhanced impression made by the hats he wished to sell. He had several mirrors, adapted by various subtleties of curvature and tint to different types of face and complexion, and much depended on the proper use of these.

Denton flung himself at these curious and not very congenial duties with a good will and energy that would have amazed him a year before; but all to no purpose. The Senior Manageress, who had selected him for appointment and conferred various small marks of favor upon him, suddenly changed in her manner, declared for no assignable cause that he was stupid, and dismissed him at the end of six weeks of salesmanship. So Denton had to resume his ineffectual search for employment.

This second search did not last very long. Their money was at the ebb. To eke it out a little longer they resolved to part with their darling Dings, and took that small person to one of the public *crèches* that abounded in the city. That was the common use of the time. The industrial emancipation of women, the correlated disorganization of the secluded "home," had rendered *crèches* a necessity for all but very rich and exceptionally-minded people. Therein children encountered hygienic and educational advantages impossible without such organization. *Crèches* were of all classes and types of luxury, down to those of the labor Company, where children were taken on credit, to be redeemed in labor as they grew up.

BUT both Denton and Elizabeth being, as I have explained, strange old-fashioned young people, full of nineteenth-century ideas, hated these convenient *crèches* exceedingly and at last took their little daughter to one with extreme reluctance. They were received by a motherly person in a uniform who was very brisk and prompt in her manner until Elizabeth wept at the mention of parting from her child. The motherly person, after a brief astonishment at this unusual emotion, changed suddenly into a creature of hope and comfort, and so won Elizabeth's gratitude for life. They were conducted into a vast room presided over by several nurses and with hundreds of two-year-old girls grouped about the toy-covered floor. This was the Two-year-old Room. Two nurses came forward, and Elizabeth watched their bearing towards Dings with jealous eyes. They were kind—it was clear they felt kind, and yet . . .

Presently it was time to go. By that time Dings was happily established in a corner, sitting on the floor with her arms filled, and herself, indeed, for the most part hidden by an unaccustomed wealth of toys. She seemed careless of all human relationships as her parents receded.

They were forbidden to upset her by saying good-bye.

At the door Elizabeth glanced back for the last time, and behold! Dings had dropped her new wealth and was standing with a dubious face. Suddenly Elizabeth gasped, and the motherly nurse pushed her forward and closed the door.

"You can come again soon, dear," she said, with unexpected tenderness in her eyes. For a moment Elizabeth stared at her with a blank face. "You can come again soon," repeated the nurse. Then with a swift transition Elizabeth was weeping in the nurse's arms. So it was that Denton's heart was won also.

And three weeks after our young people were absolutely penniless, and only one way lay open. They must go to the Labor Company. So soon as the rent was a week overdue their few remaining possessions were seized, and with scant courtesy they were shown the way out of the hotel. Elizabeth walked along the passage towards the staircase that ascended to the motionless middle way, too dulled by misery to think. Denton stopped behind to finish a stinging and unsatisfactory argument with the hotel porter, and then came hurrying after her, flushed and hot. He slackened his pace as he overtook her, and together they ascended to the middle way in silence. There they found two seats vacant and sat down.

"We need not go there—*yet?*" said Elizabeth.

"No—not till we are hungry," said Denton.

They said no more.

Elizabeth's eyes sought a resting-place and found none. To the right roared the eastward ways, to the left the ways in the opposite direction, swarming with people. Backwards and forwards along a cable overhead rushed a string of gesticulating men, dressed like clowns, each marked on back and chest with one gigantic letter, so that altogether they spelt out:

"PURKINJE'S DIGESTIVE PILLS"

An anæmic little woman in horrible coarse blue canvas pointed a little girl to one of this string of hurrying advertisements.

"Look!" said the anæmic woman: "ther's yer father."

"Which?" said the little girl.

"'Im wiv his nose colored red," said the anæmic woman.

The little girl began to cry, and Elizabeth could have cried too.

"Ain't 'e kickin' 'is legs!—*just!*" said the anæmic woman in blue, trying to make things bright again. "Looky—*now!*"

On the *facade* to the right a huge intensely bright disc of weird color span incessantly, and letters of fire that came and went spelt out—

"Does this make you Giddy?"

Then a pause, followed by

"Take a Purkinje's Digestive Pill."

A vast and desolating braying began. "If you love Swagger Literature, put your telephone on to Bruggles, the Greatest Author of all Time. The Greatest Thinker of all Time. Teaches you Morals up to your Scalp! The very image of Socrates, except the back of his head, which is like Shakespeare. He has six toes, dresses in red, and never cleans his teeth. Hear Him!"

Denton's voice became audible in a gap in the uproar. "I never ought to have married you," he was saying. "I have wasted your money, ruined you, brought you to misery. I am a scoundrel . . . Oh, this accursed world!"

She tried to speak, and for some moments could not. She grasped his hand. "No," she said at last.

A half-formed desire suddenly became determination. She stood up. "Will you come?"

He rose also. "We need not go there yet."

"Not that. But I want you to come to the flying stages—where we met. You know? The little seat."

He hesitated. "*Can* you?" he said, doubtfully.

"Must," she answered.

He hesitated still for a moment, then moved to obey her will.

And so it was they spent their last half-day of freedom out under the open air in the little seat under the flying stages where they had been wont to meet five short years ago. There she told him, what she could not tell him in the tumultuous public ways, that she did not repent even now of their marriage—that whatever discomfort and misery life still had for them, she was content with the things that had been. The weather was kind to them, the seat was sunlit and warm, and overhead the shining aeroplanes went and came.

At last towards sunsetting their time was at an end, and they made their vows to one another and clasped hands, and then rose up and went back into the ways of the city, a shabby-looking, heavy-hearted pair, tired and hungry. Soon they came to one of the pale blue signs that marked a Labor Company Bureau. For a space they stood in the middle way regarding this and at last descended and entered the waiting room.

THE Labor Company had originally been a charitable organization; its aim was to supply food, shelter and work to all comers. This it was bound to do by the conditions of its incorporation, and it was also bound to supply food and shelter and medical attendance to all incapable of work who chose to demand its aid. In exchange these incapables paid labor notes, which they had to redeem upon recovery. They signed these labor notes with thumb-marks, which were photographed and indexed in such a way that this world-wide Labor Company could identify any one of its two or three hundred million clients at the cost of an hour's inquiry. The day's labor was defined as two spells in a treadmill used in generating electrical force, or its equivalent, and its due performance could be enforced by law. In practice the Labor Company found it advisable to add to its statutory obligations of food and shelter a few pence a day as an inducement to effort; and its enterprise had not only abolished pauperization altogether, but supplied practically all but the very highest and most responsible labor throughout the world. Nearly a third of the population of the world were its serfs and debtors from the cradle to the grave.

In this practical, unsentimental way the problem of the unemployed had been most satisfactorily met and overcome. No one starved in the public ways, and no rags, no costume less sanitary and sufficient than the Labor Company's hygienic but inelegant blue canvas, pained the eye throughout the whole world. It was the constant theme of the phonographic newspapers how much the world had progressed since nineteenth-century days, when the bodies of those killed by the vehicular traffic or dead of starvation were, they alleged, a common feature in all the busier streets.

Denton and Elizabeth sat apart in the waiting room until their turn came. Most of the others collected there seemed limp and taciturn, but three or four young people gaudily dressed made up for the quietude of their companions. They were life clients of the Company, born in the Company's *crèche* and destined to die in its hospital, and they had been out for a spree with some shillings or so of extra pay. They talked vociferously in a later development of the Cockney dialect, manifestly very proud of themselves.

Elizabeth's eyes went from these to the less assertive figures. One seemed exceptionally pitiful to her. It was a woman of perhaps forty-five, with gold-stained hair and a painted face, down which abundant tears had trickled; she had a pinched nose, hungry eyes, lean hands and shoulders, and her dusty worn-out finery told the story of her life. Another was a grey-bearded old man in the costume of a bishop of one of the high episcopal sects—for religion was now also a business, and had its ups and downs. And beside him a sickly, dissipated-looking boy of perhaps two-and-twenty glared at Fate.

Presently Elizabeth and then Denton interviewed the manageress—for the Company preferred women in this capacity—and found she possessed an energetic face, a contemptuous manner, and a particularly unpleasant voice. They were given various checks, including one to certify that they need not have their heads cropped; and when they had given their thumb-marks, learnt the number corresponding thereunto, and exchanged their shabby middle-class clothes for duly numbered blue canvas suits, they repaired to the huge plain dining-room for their first meal under these new conditions. Afterwards they were to return to her for instructions about their work.

When they had made the exchange of their clothing Elizabeth did not seem able to look at Denton at first; but he looked at her, and saw with astonishment that even in blue canvas she was still beautiful.

And then their soup and bread came sliding on its little rail down the long table towards them and stopped with a jerk, and he forgot the matter. For they had had no proper meal for three days.

After they had dined they rested for a time. Neither talked—there was nothing to say; and presently they got up and went back to the manageress to learn what they had to do.

The manageress referred to a tablet. "Y'r rooms won't be here; it'll be in the Highbury Ward, ninety-seventh way, number two thousand and seventeen. Better make a note of it on y'r card. *You,* nought nought nought, type seven, sixty-four, b.c.d., *gamma* forty-one, female; you 'ave got to go to the Metal-beating Company and try that for a day—fourpence bonus if ye're satisfactory; and *you,* nought seven one, type four, seven hundred and nine, g.f.b., *pi* five and ninety, male; you 'ave to go to the Photographic Company on Eighty-first way, and learn something or other—*I* don't know—thrippence. 'Ere's y'r cards. That's all. Next! *What?* Didn't catch it all? Lor! So suppose I must go over it all again. Why don't you listen? Keerless, improvident people! One'd think these things didn't matter."

THEIR ways to their work lay together for a time. And now they found they could talk. Curiously enough, the worst of their depression seemed over now that they had actually donned the blue. Denton could talk with interest even of the work that lay before them. "Whatever it is," he said, "it can't be so hateful as that hat shop. And after we have paid for Dings we shall still have a whole penny a day between us even now. Afterwards—we may improve—get more money."

Elizabeth was less inclined to speech. "I wonder why work should seem so hateful," she said.

"It's odd," said Denton. "I suppose it wouldn't be if it were not the thought of being ordered about . . . I hope we shall have decent managers."

Elizabeth did not answer. She was not thinking of that. She was tracing out some thoughts of her own.

"Of course," she said presently, "we have been using up work all our lives. It's only fair—"

She stopped. It was too intricate.

"We paid for it," said Denton, for at that time he had not troubled himself about these complicated things.

"We did nothing—and yet we paid for it. That's what I cannot understand."

"Perhaps we are paying," said Elizabeth presently—for her theology was old-fashioned and simple.

Presently it was time for them to part, and each went to the appointed work. Denton's was to mind a complicated hydraulic press that seemed almost an intelligent thing. This press worked by the sea-water that was destined finally to flush the city drains—for the world had long since abandoned the folly of pouring drinkable water into its sewers. This water was brought close to the eastward edge of the city by a huge canal, and then raised by an enormous battery of pumps into reservoirs at a level of four hundred feet above the sea, from which it spread by a billion arterial branches over the city. Thence it poured down, cleansing, sluicing, working machinery of all sorts, through an infinite variety of capillary channels into the great drains, the *cloacae maximae,** and so carried the sewage out to the agricultural areas that surrounded London on every side.

The press was employed in one of the processes of the photographic manufacture, but the nature of the process it did not concern Denton to understand. The most salient fact to his mind was that it had to be conducted in ruby light, and as a consequence the room in which he worked was lit by one colored globe that poured a lurid and painful illumination about the room. In the darkest corner stood the press whose servant Denton had now become: it was a huge, dim, glittering thing with a projecting hood that had a remote resemblance to a bowed head, and, squatting like some metal Buddha in this weird light that ministered to its needs, it seemed to Denton in certain moods almost as if this must needs be the obscure idol to which humanity in some strange aberration had offered up his life. His duties had a varied monotony. Such items as the following will convey an idea of the service of the press. The thing worked with a busy clicking so long as things went well; but if the paste that came pouring through a feeder from another room and which it was perpetually compressing into thin plates, changed in quality, the rhythm of its click altered and Denton hastened to make certain adjustments. The slightest delay involved a waste of paste and the docking of one or more of his daily pence. If the supply of paste waned—there were hand processes of a peculiar sort involved in its preparation, and sometimes the workers had convulsions which deranged their output—Denton had to throw the press out of gear. In the painful vigilance a multitude of such trivial attentions entailed, painful because of the incessant effort its absence of natural interest required, Denton had now to pass one-third of his days. Save for an occasional visit from the manager, a kindly but singularly foul-mouthed man, Denton passed his working hours in solitude.

Elizabeth's work was of a more social sort. There was a fashion for covering the private apartments of the very wealthy with metal plates beautifully embossed with repeated patterns. The taste of the time demanded, however, that the repetition of the patterns should not be exact—not mechanical, but "natural"—and it was found that the most pleasing arrangement of pattern irregularity was obtained by employing women of refinement and natural taste to punch out the patterns with small dies. So many square feet of plates was exacted from Elizabeth as a minimum, and for whatever square feet she did in excess she received a small payment. The room, like most rooms of women workers, was under a manageress: men had been found by the Labor Company not only less exacting but extremely liable to excuse favored ladies from a proper share of their duties. The manageress was a not unkindly, taciturn person, with the hardened remains of beauty of the brunette type; and the other women workers, who of course hated her, associated her name scandalously with one of the metal-work directors in order to explain her position.

Only two or three of Elizabeth's fellow-workers were born labor serfs; plain, morose girls, but most of them corresponded to what the nineteenth century would have called a "reduced" gentlewoman. But the ideal of what constituted a gentlewoman had

*Principal or largest sewers.

altered: the faint, faded, negative virtue, the modulated voice and restrained gesture of the old-fashioned gentlewoman had vanished from the earth. Most of her companions showed in discolored hair, ruined complexions, and the texture of their reminiscent conversations, the vanished glories of a conquering youth. All of these artistic workers were much older than Elizabeth, and two openly expressed their surprise that any one so young and pleasant should come to share their toil. But Elizabeth did not trouble them with her old-world moral conceptions.

THEY were permitted, and even encouraged to converse with each other, for the directors very properly judged that anything that conduced to variations of mood made for pleasing fluctuations in their patterning; and Elizabeth was almost forced to hear the stories of these lives with which her own interwove: garbled and distorted they were by vanity indeed and yet comprehensible enough. And soon she began to appreciate the small spites and cliques, the little misunderstandings and alliances that enmeshed about her. One woman was excessively garrulous and descriptive about a wonderful son of hers; another had cultivated a foolish coarseness of speech, that she seemed to regard as the wittiest expression of originality conceivable; a third mused for ever on dress, and whispered to Elizabeth how she saved her pence day after day, and would presently have a glorious day of freedom, wearing . . . and then followed hours of description; two others sat always together, and called one another pet names, until one day some little thing happened, and they sat apart, blind and deaf as it seemed to one another's being. And always from them all came an incessant tap, tap, tap, tap, and the manageress listened always to the rhythm to mark if one fell away. Tap, tap, tap, tap: so their days passed, so their lives must pass. Elizabeth sat among them, kindly and quiet, gray-hearted, marveling at Fate: tap, tap, tap; tap, tap, tap; tap, tap, tap.

So there came to Denton and Elizabeth a long succession of laborious days, that hardened their hands, wove strange threads of some new and sterner substance into the soft prettiness of their lives, and drew grave lines and shadows on their faces. The bright, convenient ways of the former life had receded to an inaccessible distance; slowly they learnt the lesson of the under-world—sombre and laborious, vast and pregnant. There were many little things happened: things that would be tedious and miserable to tell, things that were bitter and grievous to bear—indignities, tyrannies, such as must ever season the bread of the poor in cities; and one thing that was not little, but seemed like the utter blackening of life to them, which was that the child they had given life to sickened and died. But that story, that ancient, perpetually recurring story, has been told so often, has been told so beautifully, that there is no need to tell it over again here. There was the same sharp fear, the same long anxiety, the deferred inevitable blow, and the black silence. It has always been the same; it will always be the same. It is one of the things that must be.

And it was Elizabeth who was the first to speak, after an aching, dull interspace of days: not, indeed, of the foolish little name that was a name no longer, but of the darkness that brooded over her soul. They had come through the shrieking, tumultuous ways of the city together; the clamor of trade, of yelling competitive religions, of political appeal, had beat upon deaf ears; the glare of focussed lights, of dancing letters, and fiery advertisements, had fallen upon the set, miserable faces unheeded. They took their dinner in the dining-hall at a place apart. "I want," said Elizabeth clumsily, "to go out to the flying stages—to that seat. Here, one can say nothing. . . ."

Denton looked at her. "It will be night," he said.

"I have asked,—it is a fine night." She stopped.

He perceived she could find no words to explain herself. Suddenly he understood that she wished to see the stars once more, the stars they had watched together from the open downland in that wild honeymoon of theirs five years ago. Something caught at his throat. He looked away from her.

"There will be plenty of time to go," he said, in a matter-of-fact tone.

And at last they came out to their little seat on the flying stage, and sat there for a long time in silence. The little seat was in shadow, but the zenith was pale blue with the effulgence of the stage overhead, and all the city spread below them, squares and circles and patches of brilliance caught in a mesh-work of light. The little stars seemed very faint and small: near as they had been to the old-world watcher, they had become now infinitely remote. Yet one could see them in the darkened patches amidst the glare, and especially in the northward sky, the ancient constellations gliding steadfast and patient about the pole.

Long our two people sat in silence, and at last Elizabeth sighed.

"If I understood," she said, "if I could understand. When one is down there the city seems everything—the noise, the hurry, the voices—you must live, you must scramble. Here—it is nothing; a thing that passes. One can think in peace."

"Yes," said Denton. "How flimsy it all is! From here more than half of it is swallowed by the night. . . . It will pass."

"We shall pass first," said Elizabeth.

"I know," said Denton. "If life were not a moment, the whole of history would seem like the happening of a day . . . Yes—we shall pass. And the city will pass, and all the things that are to come. Man and the Overman and wonders unspeakable. And yet . . ."

He paused, and then began afresh. "I know what you feel. At least I fancy . . . Down there one thinks of one's work, one's little vexations and pleasures, one's eating and drinking and ease and pain. One lives, and one must die. Down there and everyday—our sorrow seemed the end of life. . . .

"Up here it is different. For instance, down there it would seem impossible almost to go on living if one were horribly disfigured, horribly crippled, disgraced. Up here—under these stars—none of those things would matter. They don't matter. . . . They are a part of something. One seems just to touch that something—under the stars. . . ."

He stopped. The vague, impalpable things in his mind, cloudy emotions half shaped towards ideas, vanished before the rough grasp of words. "It is hard to express," he said lamely.

They sat through a long stillness.

"It is well to come here," he said at last. "We stop—our minds are very finite. After all we are just poor animals rising out of the brute, each with

a mind, the poor beginning of a mind. We are so stupid. So much hurts. And yet . . ."

"I know, I know—and some day we shall *see*.

"All this frightful stress, all this discord will resolve to harmony, and we shall know it. Nothing is but it makes for that. Nothing. All the failures—every little thing makes for that harmony. Everything is necessary to it, we shall find. We shall find. Nothing, not even the most dreadful thing, could be left out. Not even the most trivial. Every tap of your hammer on the brass, every moment of work, my idleness even . . . Dear one! every movement of our poor little one . . . All these things go on for ever. And the faint impalpable things. We, sitting here together.—Everything . . .

"The passion that joined us, and what has come since. It is not passion now. More than anything else it is sorrow. *Dear . . .*"

He could say no more, could follow his thoughts no further.

Elizabeth made no answer—she was very still; but presently her hand sought his and found it.

(End of Part I.)

The Fallacy in "Ten Million Miles Sunward"

By PROF. W. J. LUYTEN

of Harvard College Observatory, Cambridge, Mass.

It is with a feeling of gratification that we publish for the benefit of our readers, the interesting note from Professor Luyten, pointing out the fallacy in the story, "TEN MILLION MILES SUNWARD." A force coming from the outside is essential to change the earth's orbit, and it will be observed that the energy involved in a tremendous rapidity of flow of water into the Caspian Sea, or the discharge of some inconceivably great projectile would bring to bear a force from the outside. We naturally cannot and do not wish to add anything to Professor Luyten's very clear and comprehensive statement.

In connection with the idea of discharging projectiles, we may refer to Jules Vern's story, "The Purchase of the North Pole," in our issues of September and October, 1926. Here, in order to shift the North Pole, Jules Verne's scientists discharge an enormous projectile into space, in exact accordance with Professor Luyten's statement. Jules Verne' in his story, however, assumed that the people of his tale merely desired to shift the North Pole toward the Temperate Zone, and not to divert the earth from its orbit.

ASTRONOMICALLY speaking, the thing is totally unsound; it is entirely impossible to change the course of the earth (I mean in its path around the sun) by doing anything from the earth itself. To change the earth's orbit would require a force coming from the outside. At the most, we could do a little toward it by breaking the earth in two, then the two bits might very well pursue another orbit. The fundamental law of mechanics is that the centre of gravity of the earth will remain in its orbit *so long as only interior forces act*, and in the case of the Caspian adventure we are dealing with a purely interior force. Besides, the shifting of the centre of gravity on its account would be very small.

If the water flowed from the Black Sea into the Caspian at a tremendous rate of speed, it might for the time being slow down the *rotation* of the earth a little and make the day a few seconds longer, but would have no further effect. After the Caspian had been filled up the rotation would come back to practically the same value it had before. Also, in such a case, if the earth swerved at all from its course, it would do that gradually, and not suddenly.

If we were really in the predicament proposed by the author of "Ten Million Miles Sunward" our only salvation would lie in shooting off enormous projectiles in the direction opposite to the way we wanted to go. This is essentially a force from the outside.

Concerning the Black Sea-Caspian connection it might be of interest to know that there is a canal between the rivers Don and Volga, thereby connecting these two seas. At least so I was told when I was in Russia last summer. I do not think however that the thing is on any large scale and probably too high up to fill the Caspian with Black Sea water.

The YEAST MEN

by David H. Keller M.D.

Author of "The Revolt of the Pedestrians"

UNLESS the unexpected happened, Moronia would be destroyed. The last war had destroyed many of her young men, ruined her finances and deprived her people of even a hope for better years to come. The kingdom of Eupenia now completely surrounded Moronia, shutting off on all sides her commerce and intercourse with friendly nations. The next war would end the struggle and strife that had lasted for centuries.

Like a previous conqueror, Premier Plautz arose day after day in the Eupenian Senate to croak out his celebrated, quadruple-worded threat—a threat that he hoped some day would be fulfilled prophecy. "Moronia must be destroyed!" he cried, and the Eupenians, drunk with success and power, answered with renewed plaudits and increased appropriations for the final struggle. "Moronia must be destroyed!" he said on the 1st of September, 19—. "She lies in the middle of our fair country, like a dreaded and threatening cancer. We have cut off her commerce and bled her manpower white. Now is the time to destroy her, and occupy her farms and cities with our own deserving populace. Moronia must be destroyed! Our army hopes to occupy her capital by Christmas Day. After such a victory we will have good reason to celebrate the Birthday of our Master. From that day on the word Moronia will only be a memory and a warning—a memory of our power and a warning to any future enemy. Moronia must be destroyed! Moronia shall be destroyed!!"

Immediately after this short address the Senate adjourned. The War Council met that afternoon to perfect plans for the next war, as yet undeclared. Just as he did in the Senate, Premier Plautz dominated this body. At once he asked the Chief of the Air Service if his corps was prepared for war.

"We are, Your Excellency!" was the unexpected reply from Colonel Von Dort. "We are prepared for war, but we are also prepared for more than the attack. I have in readiness one thousand planes, each manned by two experienced aviators. At your command, the air service will begin the assault, but I warn you in advance that we will lose one thousand planes and two thousand men at the first attack. We are prepared—for Death!"

"That is the speech of a coward. Are all of the corps like you?" demanded Premier Plautz. "I am informed the Moronians have only a few air craft. Of what are you afraid?"

"We fear nothing," replied Von Dort, white with suppressed anger, "but we know the truth. Since the last war, Moronia has perfected some kind of a light-ray. A machine is placed every mile along their entire border. From these machines the rays go out, presumably in a fan shape. When the ray strikes an airplane, the engine not only stops but apparently explodes. No one knows how high in the air these rays go—we have never been able to rise above the range of their power. We have been experimenting and have found no way of defending the plane against the ray. So far, twenty of our planes, disguised as commercial machines, have been destroyed and our aviators killed. In every instance the bodies were brought to the frontier by the Moronians, and each time they have simply explained that something went wrong with the machinery and the plane dropped in their country. We have every reason to believe that they have perfected some power which will render impossible any attack on the enemy by air. What happened to twenty planes will happen to a thousand. That is why I said my corps was prepared for death."

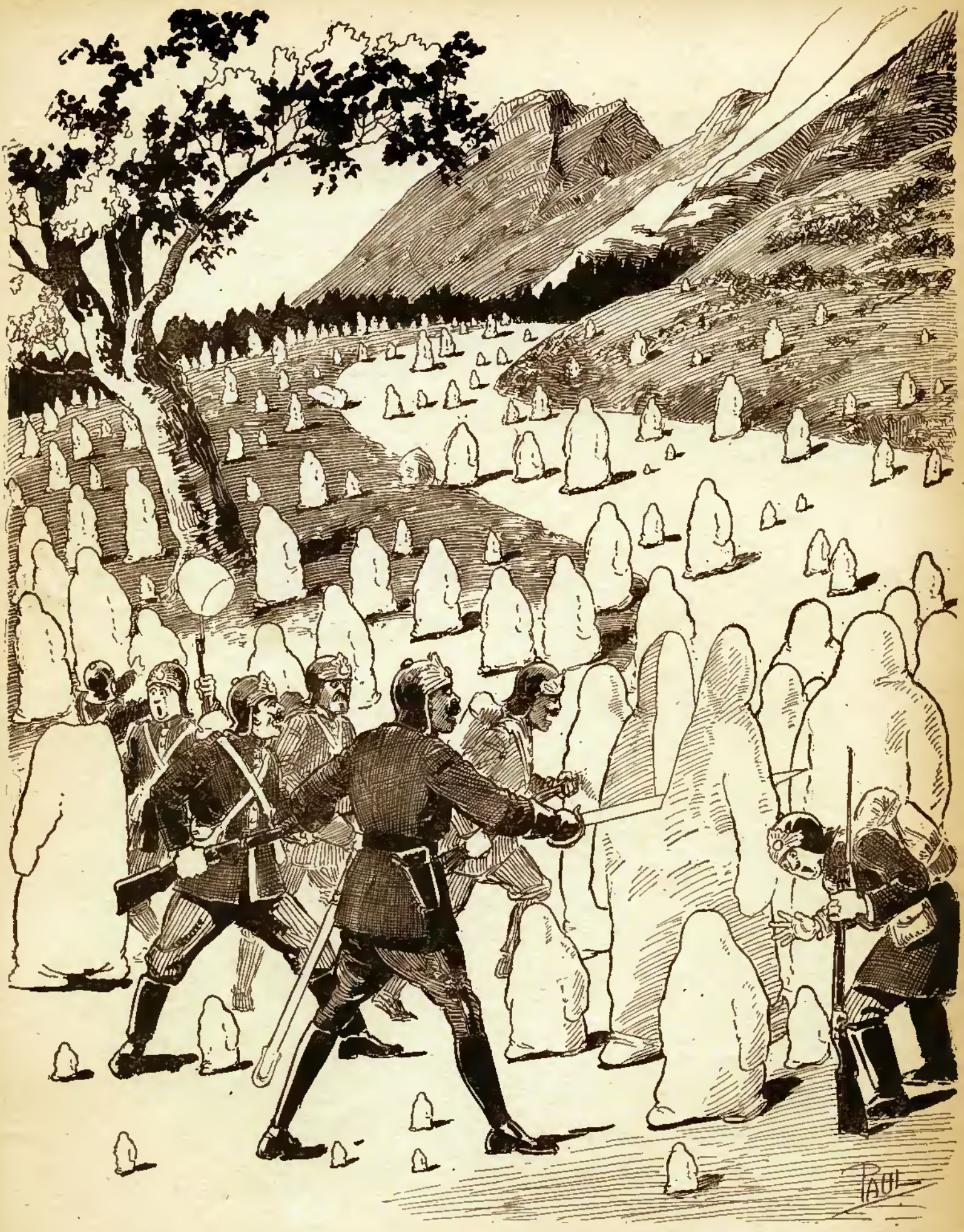
The Premier started to pound the table with his fist, "Why was I not informed of this? What has been done to protect our machines? The destruction of one plane was enough to justify a new war. What have you been doing besides skulking in cowardice?"

"I made daily reports to the Chief of Staff," retorted Von Dort. "The entire matter is on record. For a month our Department of Physics and Chemistry has been working on this problem. They thought they had a satisfactory defense, and the last ten planes were supposed to have been protected, but they crumpled like the first ten."

"Colonel Von Dort is right," interrupted the Chief of Staff, General Hurlung. "All reports have been filed regularly, and a daily summary has been sent to your office. After all, it is a purely military problem. We still have the other arms of the service, the calvary, artillery and infantry. With our calvary alone, we could overrun Moronia. We need not worry about the air service."

YOU have, of course, read Dr. Keller's story, "The Revolt of the Pedestrians," which we printed in the February issue. Literally thousands of letters were received by us commenting upon this unusual story. This month Dr. Keller comes to the fore again with a tale which will range easily as one of the best scientifiction stories of 1928. For sheer originality, daring of thought and uniqueness, this story is outstanding. It contains good science, for the Yeast Men actually could perform all the things that Dr. Keller so vividly portrays here.

Modern warfare is very much as is described by this interesting author. Gas has been introduced only during the last war, and we may be sure that situations such as Dr. Keller depicts will come about soon enough.



The whole resistance was hopeless. The Yeast Men arrived day after day in increasing numbers and they could not be killed. They could be mutilated, dissevered, decapitated, but each piece lived and moved onwards . . . What use cutting a thing to pieces when each piece kept on living and advancing? How could an enemy be killed when it could not bleed?

"Oh! I suppose so. I suppose so!" replied the Premier, petulantly. "Still I wanted to blow them into hell with air bombs—all of them, men, women and children."

"But if you did that you would also destroy property," argued General Hurlung. "The infantry can wipe out the population just as effectively without the loss of a single structure. What worries me is this: They have a powerful ray of some kind which we know can destroy a plane at ten thousand feet. Suppose they turn these rays sidewise on our advancing army? What will happen?"

"Bah! You are growing old, General," sneered the Premier. "Have we not the artillery to blast our way through such infernal machines? Our infantry are men, not machines. They can live through any kind of hell-fire and win the victory. I am fretted at the atmosphere of doubt that covers this council of war. We will attack on the first of October, opening with artillery, following with calvary, and mopping up with the infantry. These machines you dread so much are only machines, and all machines must be run by men. Kill the men and the machines are harmless. General Hurlung, you will prepare all branches of the army for the attack. Colonel Von Dort, you are dismissed from the service for cowardice. Go where you please, but if you are in Eupenia at the end of two days, I will have you shot."

Von Dort, drawing his dress sword, broke it over his knee and threw the pieces on the table in front of the Premier. Said Von Dort, "A country that thus rewards honesty is a land rotten to the core." The men around the table kept an awkward silence as he left the room.

Premier Plautz stood up. "You gentlemen know what to do. I will accept no excuses for incompetency. Moronia must be destroyed. We will meet again a week from today. The Secret Service had better follow Von Dort and imprison him. I do not trust him. Keep him in solitary confinement and I will deal finally with him in a few days."

Von Dort, however, was already in his automobile, leaving Eupenia as fast as he could. He paused at his home only long enough to almost throw his wife and baby and a few valuables into his car; then he started for Moronia at seventy miles an hour. Von Dort was thoroughly mad. For ten years he had served in the air service of Eupenia, advancing slowly from mechanician to Chief of the Service. During that time he had done his best. Under his leadership the corps had achieved the finest type of morale. He knew that his men were always ready to gamble on a chance in war, but he could not sit still and see his entire force sent to what he felt was certain death. During his ten years of military service he had had ample chance to study the Premier. He knew that every man who had dared to oppose Plautz had come to an unfortunate end, disgrace, exile or death. Life to Von Dort, with his wife and baby was too sweet to be sacrificed unless absolutely necessary. The former Chief of the Air Service fully realized all this. He increased the speed of his car. Moronia was his destination for other reasons than because it was the nearest border. He felt that he could trust them, as enemies, more than he could trust the other nations who were friendly to Eupenia. Also, his wife had come from that nation. She was the daughter of a former Moronian general, who died in the last war. Von Dort had been a member of the army of occupation, and once having met this particular young lady, all his loyalty to Eupenia was insufficient to prevent him from falling in love. He felt that if he had to die, it would be better to die with his wife and baby in the mountains of Moronia, than in solitude in an Eupenian prison.

THE radio message beat them to the frontier, and Von Dort saw that the barricade had been lowered. It was a sturdy wooden gate, but the automobile hit it going eighty miles an hour and reduced it to kindling. The car finally stopped, rather disheveled in looks but with the motor still running, one mile inside Moronia. There Von Dort stopped as soon as possible, having a deep respect for the vigilance and accurate shooting of the Moronia border patrol. He did not wish to arouse their suspicion in any way. The car was soon surrounded by cavalrymen, who politely but firmly asked for full details as to his identity and reason for entering the country in such a precipitous manner. Realizing that there was no reason for deceit, he gave them a brief account of his trouble and asked to be taken to the General-in-Chief of the Moronian army.

Moronia, nominally a monarchy, was in every respect democratic, except that it had a King. Every citizen felt an equal amount of reverence and fraternity for this monarch. There was rank, both in civil and military life, but promotion was by merit and without either syncophancy or tyranny. Consequently it was easier to see the Commanding General in Moronia than it was to see the Third Assistant Secretary of Agriculture in Eupenia. The Moronians lived among the mountains, and like the eagles of the crags, prized their liberty. In consequence of all this it was only a few hours before Von Dort was telling his story to General Androvitz and his staff.

They believed all that he said. Especially did they believe him after his wife talked to them in their native patois. There were some present who had known her father well. One old officer was even able to remember the celebration of her christening. The general discussion was finally ended by Von Dort.

"I fled because I knew that Premier Plautz intended to have me killed, and I came here because of my wife and because I felt keenly the injustice of another war. Moronia is to be destroyed for no other reason than selfishness and greed. The force against you is overwhelming. I see nothing save your final and complete destruction. If I have to die I want to die fighting rather than die in a prison, or shot, or hanged like a criminal. I offer you my services, General Androvitz, and am willing to serve your country in any capacity."

The General at once sent for the King to join their deliberations. Rudolph Hubelaire came, a little, withered, one-armed man with the fire of a lion in his eye. He heard the news without changing expression. The other men watched him anxiously. Finally he spoke.

"We can die but once. Resistance, in our weakened state, will be but a grand gesture. Eupenia may conquer the country but she will never enslave our patriots. They and their families may die, but they will never surrender. When the time comes, we will fight. When that is over, the survivors will retire to our mountain forts. There we will live with the

goats and chamois. I am sorry that it all has to end thus, but we have done our best. One more invention like our ultra-light rays would have saved us—but our scientists have done their best, and as we have failed, so have they. Colonel Von Dort, we trust your honesty and welcome you to our ranks. Your desire to die on the field of battle will probably be realized."

The meeting was just breaking up, each participant ready to carry the sad news to his friends, when the guard at the door announced the presence of Mr. Billings, one of Monrovia's staff of scientific investigators.

"Poor Billings," said the King, "a harmless fellow from America. He has worked in our laboratory for years without pay except for his bare expenses, and he is about broken-hearted because so far he has failed to make any discovery of importance. I wish we could get him back to America before war begins. Let us humor the old gentleman and listen to his story. I want you to show his age the proper respect. Let there be no levity. His loyalty and faithful endeavor demand our greatest courtesy."

Billings came in and was seated by the King. He was stooped-shouldered, bald and trembling. His high-pitched voice cracked like static under his excitement.

"Your Majesty and Gentlemen," he said. "After years of the most tedious experimentation, I have finally discovered a method of defending ourselves against the Eupenians."

"Fine!" said the King. "Now tell us all about it."

"I propose that we make an army of Yeast Men."

"That is a fine idea, Mr. Billings," said the King soothingly. "I am sure that your discovery has merit. Now I want you to go over to America and take a long vacation, and after you are thoroughly rested you can come back and visit us again."

"But you do not understand," pleaded the old man. "I suppose you think that I am senile. The invention is complete and I am sure it will work. It is practical and simple. The one machine I have made functions perfectly. It can easily be duplicated, and anyone can run it. All we need is an abundance of yeast and hundreds of machines. You shoot the little fellows out like bullets from a machine gun."

"Well, what happens then?" asked General Androvitz.

"They just grow and walk around a little and then they die."

"If they do that they will be typical soldiers," interrupted the Chief of the Artillery Service. "That is about all we will do between now and Christmas."

"But in dying they will win the victory!" eagerly chirped the inventor in his high-pitched cricket voice." Cannot you understand that they will die and rot in Eupenia?"

The King gently took the old man by the shoulder and as he talked the tears came to his eyes.

"MY dear Billings. The thing you describe is just a soldier. For hundreds of years the Moronians have died in defense of their country. They had died and rotted, and yet we, as a nation, have slowly withered away. Brave men by the thousand have done just that, and to what avail? Your eagerness to help has worried you sick. Go and take a long rest. Yeast Men and real men may die and rot but our dear Moronia is doomed."

"But cannot you see it?" pleaded the inventor. "Oh! Please try to see it. Yeast Men by the millions and billions walking into Eupenia and rotting there. Cannot you see how it is going to work?"

"I beg your pardon," asked General Androvitz, "but did you say billions?"

"I did. A few drops of yeast grows to be a soldier six feet tall. Give me as many machines as those you made to generate the anti-aircraft rays and I will produce Yeast Men by the million. I will make a million every day as long as it is necessary."

"And they live just so long and then die?" asked the King.

"Yes, they live about three days. During that time they are able to move about twenty-five miles. Then they die and rot."

"A fairy tale," said the Premier, who, up to this time, had kept silent.

"But I can prove it. I have made one. If you see just one of them, will you believe it? Let me show you just one!"

The King held up his hand for silence.

"Gentlemen, let me talk to Billings. Please do not interrupt. He is nervous—and so am I. We must get to the real truth in this matter. I would never forgive myself if he really found something of value and lost it because of our incredulity. Now, Friend Billings, let us pretend that we are alone. Pay no attention to these other men. Listen to my questions, and answer them as simply as you can. Remember that I am not a scientist and do not understand big words. Now, how much yeast does it take to make a soldier?"

"About two drops."

"How big does he grow?"

"About six feet tall."

"Do they look like real men?"

"Just a little. You see they are made of dough."

"Do they walk as we do?"

"No. It is sort of a creeping shuffle—amoeba movement."

"If they are not destroyed, how long will they live?"

"About three days."

"What happens then?"

"They cease to grow or move. They die and decay—rot."

"Suppose one of them is shot or has his head cut off with a saber, or is torn into pieces by a cannon ball, what then?"

"Each piece would keep on living and growing and moving till the end of the third day."

"You said they would move at eight miles an hour?"

"Yes, if nothing stopped them. They would be in Eupenia at the end of forty-eight hours, and by the end of the third day they would rot there."

"Are you sure of all this?"

"It worked out in the laboratory."

"What makes them grow?"

"It is a peculiar form of yeast. In the machine we compress it. Just as soon as it is liberated, it begins to extract nitrogen from the air, and expands. It not only expands, but it actually grows by the rapid division of the yeast cells."

"I do not understand it," said the King, "but I am willing to take your word for it. What makes them move?"

"Radiant energy. Before the yeast is put into the

guns, it is thoroughly energized with a form of radium."

"But these peculiar creatures cannot fight: they have no weapons: how can they win a war?"

"By their rotting, Your Majesty. I have tried to make that plain to you. They die and rot."

"You mean they decay?"

"Exactly. They dissolve into pools of slime. They form a puddle about three feet in diameter and weighing about thirty pounds."

"How would such decaying masses stop an invading army?"

"It is their stench that will stop them. The yeast is mixed with culture of Bacillus Butericus and other foetid germs. These grow in the dying and dead yeast, and produce the smell."

"That may be true, but your idea that it will stop an army is all nonsense. No soldier was checked just by a smell."

"But this will stop them. I have a little bottle here. It has one drop of the end slime diluted a thousand times. Have one of your officers smell it."

"Any volunteers?" asked the King.

"Certainly," answered the Chief of Artillery. "I have been in three wars and have smelled everything horrible known to any form of campaign. It will never hurt me."

The inventor held the opened bottle under the military man's nose. Roughly, the soldier took two deep smells. Then Billings corked the bottle, while the volunteer slumped from the chair down to the floor and lay there, white, sweating and vomiting. The others hastened to help him loosen his collar.

"My God!" exclaimed the King. "Just two whiffs from a bottle containing a thousandth of a drop, and each dead Yeast Man produces thirty pounds of the stuff. Will it kill?"

"Not men, but plants," was Billing's reply. "Look at this." He emptied the bottle on a large clay jar holding a blooming cyclamen. At once the plant withered and died. A curious foetid smell filled the room. The King rose hastily and sought an opened window. So did the rest seek doors and open windows, while carrying the fainting Chief of the Artillery Service with them.

As soon as they got outside the room, in the pure air, the King turned to the inventor:

"Show me just one man like those you describe, Mr. Billings—just one man, and the resources of the kingdom are at your command."

"I have made them. I have one now that is nearly three days old. My assistants have been leading him around an old deserted race track. You see, they go in a straight line unless they are led, and the only way we could keep him under observation was to lead him around in a track."

"We will go and see him," said the King, "and we will take with us the Professor of Mathematics from the University. Gentlemen, follow us in your cars."

The party reassembled at an old race track, overgrown with grass and a quarter mile in circumference. Slowly walking around this track was an assistant from the Morovian laboratories. Other men were resting on a bench. The walking man held a rope and was leading by it a peculiar creature. It was an Yeast Man.

IMAGINE a six-foot man of dough, with a crust hard enough to hold it erect, yet viscid enough to allow it to move forward. A creature with a head but no face, with spade-like hands without fingers, and instead of two legs and feet, simply—simply a body like a skirt, which rested firmly on the ground on a two-foot base. It was the convulsive movement of this base and the mass of fermenting yeast above it that in some way enabled it to move slowly over the ground. It was such a creature, with a broad canvas band around its waist, that the Morovians saw being led around the track. Mr. Billings ran forward eagerly and conferred with his men. Then he returned to the group of officers surrounding the King.

"They report that it had gone around the track ninety-nine times. That is twenty-three miles and nearly twenty-four. It was four feet tall at the end of the first day and at the end of the second day it was full grown. It is now nearly three days old, and if our calculations are correct, it will soon die."

The Yeast Man slowly moved around the track. Just in front of the tumbled-down grandstand it stopped. Billings instructed his men to take off the canvas belt. The party gathered around the motionless figure. Suddenly it began to grow shorter and stouter. It swayed, and finally out of balance, started to fall forward, bending at the waist. An unpleasant odor filled the air. Suddenly it bent double, and literally melted into a pool of greenish yellow slime. The odor grew increasingly frightful, so that it drove the observers further and yet further away. The grass touched by the slime withered and died.

The King turned to the professor of mathematics. "Professor," he said, "estimate the size of that puddle. Multiply it by five billion. Estimate the territory filled with that odor. Suppose such masses, five billion such masses, were scattered equally over Eupenia. What would be the result?"

The professor figured on the back of an old envelope. He used the stub of a short pencil which he nervously stuck in his mouth after every fifth figure. Finally he said, "If you could arrange to have them die at different places, the whole of Eupenia would be covered about six inches deep."

The King turned to his staff:

"I am satisfied, gentlemen. We will have hundreds of these machines made, and when we are ready to begin operations, Mr. Billings can make five thousand Yeast Men to start with. Our citizens can lead them for three days, and just as they are about to die, we will turn them loose on all the highways and open spaces leading to Eupenia. At the same time, we will start making them by the million. Our attack will come before the enemy's ready. If it works, we will obtain a bloodless victory. The only way we can make a success of it is to spring it on them as a total surprise. Cut all the wires leading to Eupenia. Confiscate at once all the radio sets. Be more careful than ever in watching the suspected spies. It would not be a bad idea to imprison them till this is over. Put a triple guard on the border. Permit no intercommunication. Turn over the entire resources of the kingdom to Mr. Billings and his associates. At the same time do not omit a single item leading to the preparedness of our little army. I understood Von Dort to say that we would be attacked on the first of October. We will attack before then—just as soon as Billings is ready. Have any of you a suggestion?"

"Yes," said the Chief of Artillery, still pale and

sweating from his recent nausea. "Why not let me follow the Yeast Men up and blow them to pieces with shrapnel? Make five yeast pieces and five stench pots out of each Yeast Man?"

"I think," replied the King, "that the Eupenians will be only too anxious to do that work for us. Again I repeat, gentlemen, that we must observe the greatest secrecy. Keep the anti-aircraft machines in constant operation, especially on cloudy days. May God save our Country and bless our good friend, Mr. Billings. Now, Gentlemen, to work, day and night, without rest, to make this machinery, gather an abundance of material and train men to use the machines."

NEAR every road connecting the two countries, large canvas camouflage screens were erected. Captive observation balloons sent up by the Eupenian air service reported no massing of Moronian troops. Behind these canvas screens, however, thousands of the men and women of the little mountain kingdom took turns leading five thousand Yeast Men in their monotonous journey toward death. All day and all night on the 17th, 18th and 19th of September, these five thousand Yeast Men moved and grew behind the protecting curtains. Their genesis had been so timed that at dusk on the third day they were two days, twenty-three hours and thirty minutes old. Then they were turned loose on the main highways and were started on their slow shuffle toward Eupenia. Some, of course, were checked at the border barricades. Others crawled around or over and had advanced several hundred yards into the enemy's country before dissolution occurred.

In the meantime peculiar-looking machine guns were being placed at intervals of one mile, each manned by a group of trained Moronian soldiers. These guns were simple in construction, and mounted on sturdy tripods. Above each was a small hopper, from which yeast was fed to a small but powerful press operated by condensed air. Each blow of the ram produced a Yeast Man one-eighth of an inch high. These were dropped into the barrel of the gun and were blown out into the air several hundred feet away from the gun. Like thistle down they floated, gradually dropping to the ground, base downward and head erect. Immediately on touching the earth, they began their peculiar shuffling movement, which was to continue in the exact direction in which they had started. As the guns worked, they revolved slowly through a forty-five degree horizontal arc.

Each gun fired two Yeast Men a second. That meant one hundred and twenty a minute; seven thousand, two hundred an hour, or 172,800 in the course of twenty-four hours. There were seven hundred guns made, but only about five hundred were in actual use at any one time; the others acting as replacements. Counting the total time these five hundred guns were in use, it was later estimated that they were fired about ten days. This made a total of 1,728,000 for each gun, or a grand total of eight hundred and sixty-four million Yeast Men manufactured during the campaign. Each Yeast Man, dead, produced thirty pounds of end-slime, a total of 12,960,000 tons. It will be remembered that this slime, in a one-to-a-thousand dilution, was sufficiently strong to produce disabling vomiting.

These guns began operations twenty-four hours before the five thousand fully-grown Yeast Men were liberated. They then moved slowly forward, and behind them came successive waves of smaller and yet smaller men of dough. At the end of the first twenty-four hours, the oldest of the Yeast Men who had been shot from the five hundred guns, were nearly four feet high. The woods and fields of Eupenia bordering on Moronia were dotted with the peculiar creatures.

The statement made by Mr. Billings that he would be able to manufacture them by the billions never materialized. The machines worked more slowly than he had anticipated. It was also seen that a large number were caught in trees and ravines and were unable to continue their march. Yet a sufficient number reached the smooth highways and level pastures to do everything that was required of them. Also the work was facilitated later in the campaign by mounting the guns in airplanes and literally showering the towns and cities with the little fellows. This, however, was not attempted till it was seen that the morale of the Eupenians was completely destroyed.

DURING the entire campaign not a single Moronian died of injuries incident to warfare, though time and again many of them fell exhausted from lack of sleep. The radium workers not only received painful burns but were affected for several years as the result of the prolonged exposure to the mysterious emanations from the weird element. These, however, were but slight horrors of war compared with what might have happened had the Eupenian attack found the Moronians in their previous defenseless condition.

During September, 1930, all had been active in the kingdom dominated by Premier Plautz, who was the real ruler of Eupenia, in place of the feeble-minded King. All branches of the army, including the aviation section, had been mobilized. Fifty thousand trained and well-armed men were in camp ready to begin the destruction of the little mountainous kingdom of Moronia. The attack was timed to begin on the first of October. Premier Plautz no longer was content with his usual statement that Moronia must be destroyed. He was now saying that the time had come for the actual work of destruction to begin. An interesting fact was that the escape of Col. Von Dort and his admission into Moronia as a place of refuge was to be made the actual *causa belli*. On the thirtieth of September his surrender was to be demanded within twenty-four hours. If it were not conceded, the Eupenian army would at once advance. If the demand were complied with, the army would advance anyway. Moronia, as far as Premier Plautz was concerned, had to be destroyed.

A broad highway connected the capital cities of the two kingdoms. This was the road used by Von Dort in his dramatic flight for safety. It was here at the border that he had crashed through the barricade. At this point, the Eupenian border guard was commanded by Lieutenant Kraut, and under him was a company of ninety privates and non-commissioned officers. On the evening of the nineteenth of September, the Lieutenant was writing his daily report and wishing for something to happen to relieve the deadly monotony of daily routine. Just as he had finished this report and was signing it, a sentry rushed in and stated that a number of pecul-

iar looking naked men were at the boundary gate trying to enter the country. Suspecting a trap, the Lieutenant at once called his entire force to arms and personally investigated the matter. When he approached the barricade, he was astonished to see a number of grayish white creatures, six feet high, moving aimlessly on the other side of the gate. They had heads without features, bodies without legs, arms without fingers. Cautiously, he touched one and shivered at the peculiar soft sensation that was imparted by the animal's skin. Realizing that his men were watching him closely and that any sign of nervousness on his part would be communicated to them, and feeling certain, too, that each of the peculiar shapes was but a mask and cloak for a Moronian soldier, he drew his revolver and shot one of the odd things several times through the heart section. The bullet holes closed and there was no blood. The thing kept on with its curious shuffling movement.

"Attention, men," he commanded. "Open the gates and we will take them all prisoners. God knows what they are, but they cannot hurt us anyway, and we will hold them till to-morrow and then send them in trucks to the General-in-Chief."

His men obeyed the command but there were many more of the new creatures than there were soldiers and thus while over seventy were captured, several hundred passed the barricade and started moving down the road.

In the guard-house the telephone was ringing violently. Headquarters wanted to know if anything new had developed and whether Lieut. Kraut and his command were safe. Disquieting messages were being received from the other outposts and they wanted an immediate report. Lieut. Kraut started to tell about the peculiar things he had captured, and the Major at the other end of the line reprimanded him for being drunk again. The Lieutenant protested that he was perfectly sober. The Major demanded an exact description of the new animal. The Lieutenant had one brought into his office and held near his desk while he gave a verbal description over the telephone. Even while he was talking, the animal softened and started to melt. The Lieutenant described the process as long as he could talk. Even while writhing on the floor in deadly nausea and vomiting, he tried to tell what had happened, but his retching only convinced the Major at Headquarters that the Lieutenant was beastly drunk. Finally the Lieutenant was dragged out of the office by two of his men, who waded through pools of indescribable filth to rescue him. He was too sick to realize that his entire command had fled from the Post, though here and there one of the soldiers lay on the road too sick to move. Outside, the road was impassable on account of the puddles of slime which dotted it. Cursing and vomiting, the Lieutenant staggered through the dark woods, seeking pure air and freedom from the stench, which even in memory produced a recurrence of the prostrating nausea.

Meantime those of the novel creatures who still lived were shuffling slowly down the broad highway, every few minutes losing one of their number by death and decay. In the dark hours of the night they died unseen and unmourned, but each of them left behind a horrible evidence that they had once lived. Over the pools of slime others of their kind walked, some three feet high, others a foot high and here and there could be seen midgets only a few inches high but resembling their larger brothers in every detail. When the sun rose, there also arose from every road between the two kingdoms, the smell of death a million times magnified. It was as though Moronia were surrounded by a circle of decay three miles deep. Meantime the smaller, younger Yeast Men were advancing into Eupenia, through the woods and meadows, tumbling into ravines, catching fast in trees and bushes, falling into streams and being swept away in the current, and yet ever with a sound like soft snow falling, the little ones, new born, were floating down through the air like goose down, and on and on the machines along the border of Moronia kept up their gentle thump-thump-thump and with each thump was created one more new life, one more soldier, brainless, fearless, bloodless, filled with the urge to keep on moving till dissolution came. And they all moved downhill, from the mountainous Moronia, into the enemies' more level country. They were perfect soldiers.

All the Eupenian out-posts had experienced the same novel sensations and made the same report that was made by Lieutenant Kraut as soon as he was able to talk. None of the officers who came to headquarters to report could produce any proof that they really had seen such massive monstrosities. Every officer had to periodically stop his verbal report till another period of vomiting had passed. The Commander-in-Chief thoroughly believed that they had gone drunk and insane through the effects of cheap whiskey and put them all under arrest. At the same time he sent several spies on motor-cycles to make a thorough investigation. These returned babbling hysterically of an army of creatures of all sizes, and every spy was vomiting with the same enthusiastic persistency that the officers had shown. The Commander-in-Chief began to curse the morals of his army and went and started to get "drunk" himself.

Even then Eupenia might have saved herself, though it is a question as to just how efficacious any campaign of shrapnel, or any building of fences or digging of ditches, would have proved. What really happened was no doubt inevitable, yet the fact remains, and it is of historical importance, that twenty-four hours passed before any offensive was started. Data was gathered and observations and lengthy reports were made. Otherwise nothing was done. These reports, especially from the border regions, were of such a varied and fantastic nature that little value could be placed on them.

FINALLY Premier Plautz decided to personally investigate the situation. He took with him the Chief-of-Staff and a group of scientists from the University. They found the new creatures by the hundreds of thousands and of all sizes. They also came as near as they could to several of the puddles of end-slime. An effort to observe these carefully with the aid of gas masks was useless. Even when some of the foetid material was gathered at the end of a long pole, it could not be brought close enough to make any observations of value. Several of the things were carefully studied, both chemically and anatomically, but not a single observer connected the moving oddities with the pools of decay. It must

be remembered that after the first hour of the offensive no more Yeast Men had died, and the reports of the rapid dissolution of the first wave were entirely discredited.

For the first time in his life, Premier Plautz was at a loss to know what to do. To him the entire situation was incomprehensible. At one side of his automobile a five foot abortion was slowly moving, its featureless face asking only one question. "Why was I made?" In the Premier's hand was a watch crystal and on the glass was a new creation, barely a quarter of an inch high, in every respect the exact duplicate of its brother standing by the side of the car.

"What does this mean, Professor Owens?" the puzzled Premier asked the Chemistry teacher. "What kind of things are these? They cannot fight. They have no weapons, no brains, no blood. All they know is how to grow and move forward. Evidently they come from Moronia, but for what reason. Is it a declaration of war?"

The old Professor answered to the best of his ability and what he said was surprisingly near the truth.

"They are just Yeast Men, Your Excellency. I have examined them in every way, chemically and microscopically and they are just peculiarly shaped masses of dough animated by some very active yeast. Their movements resemble dough overflowing a pan. I do not know what they mean but I do know what they are. I have had one cut up and baked in loaves and it tastes like a fairly good kind of whole wheat bread."

Here the Chief-of-Staff interrupted.

"Of course we could consider it as a declaration of war and attack, but what would be the influence on the world's opinion of us? Reporters would rush in from the Paris and London papers. They would make us a laughing stock of the universe. What could we say? That we were afraid of lumps of yeast? That we were using our artillery on potential loaves of bread? So far, these creatures have not committed a single depriyation. No lives have been lost, not a house burned, not a single pig or chicken killed. Think what a reporter from an American paper would do to us if he had a chance to write it up? How he would describe our infantry pouring bullets into dough, our brave cavalry men cutting the heads off of bread men? Far better would it be to take them as fast as we can and distribute them among all of our people and let them make bread with them. That would be a joke. The Eupenian nation being fed at the expense of the very enemy who hates them so."

"I believe you are right!" answered the Premier. "There is certainly nothing in such creatures to be afraid of, though their number seems to be increasing hourly. It was all well enough for the ignorant peasants to run in terror from their farms, but the city folk will look on it as a great joke—especially if we use the proper kind of propaganda. Suppose we go back at once to the capitol and prepare a statement for the press."

The next edition of The Staatsbote, the leading afternoon paper in Eupenia, ran the following news item on the front page,

HAVE YOU A LITTLE YEAST MAN IN YOUR HOME? IF NOT, WHY NOT?

All citizens are urged to at once provide their homes with one or more Yeast Men. These peculiar creatures are very harmless and the Department of Chemical Research assures us that they make a very fair quality of bread. They come in all sizes. When little, your children can play with them as dolls; when full sized, they can reduce the High Cost of Living.

All citizens having automobiles are commanded to go into the country regions and bring to their homes as many of these Yeast Men as they can accommodate. Bring extra ones for your poorer neighbor.

Army trucks will make regular trips to bring these Yeast Men to the Capitol. After they are paraded through the streets they will be distributed to all families not yet provided.

This item was published on the afternoon of the second day. All that afternoon and evening thousands of Yeast Men were brought into the towns and cities of Eupenia in private automobiles and army trucks. The Premier, quick to act for his personal advantage issued an order canceling all contracts for flour and directing that the army be supplied with bread baked from the dough creatures. Each company in the army was directed to forage for its own supply and to keep them in their tents till they were needed for baking bread.

The next morning, which was the beginning of the third day of the Moronian offensive, thousands of the Yeast Men were exhibited in parade through the streets of the Eupenian capital, each one in charge of a soldier. The citizens laughed till they cried at the comical spectacle, and slapped each other on the back as they pointed out "the only kind of soldiers Moronia could attack with." Within a few hours it became quite the fashion to have your own personal Yeast Man. Children walked around leading their little dough pets. High School pupils painted theirs with the class colors and numerals. These things could be led and guided. Herr Schmidt, Honorable President of the Ancient Order of Eupenian Cab Drivers, made a harness for a pair and had them draw a light buggy through the streets, with his grandson for driver.

That third day was a fete day for all Eupenia.

The Premier, however, had gone to unnecessary labor to bring the Yeast Men into the city. By noon they were beginning to arrive of their own accord, by the hundreds of thousands: by afternoon the streets were crowded with them. Instead of being a joke, this thing was becoming a problem. They were gathered into the parks, thrown into the cellars, herded out into the country, but still they came in increasing numbers. Every house had one or more: not a basement but was filled with a reserve supply; the barracks and tents of the army were overrun. The morning paper estimated that there was enough dough to provide bread for half a year. The problem now was not how to get them into the city but how to get them out and keep them out. In spite of Premier Plautz' reassurance in the afternoon

paper and definite orders for the army to advance on the next day, the entire populace was beginning to be worried.

Their chief anxiety arose because of the fact that they could not understand or comprehend the situation.

THEN, just towards evening, the Yeast Men began to die. Not all at once, but in increasing numbers. And twilight advanced to add darkness to the horror. Then they died by thousands and hundreds of thousands all over Eupenia. It was bad enough in the country districts where here and there the pools of end-slime dotted the woods and the meadows; but in the cities, especially in the Capital, the immediate result was a panic. In hut and palace, home and barracks, life was no longer possible on account of these thousands of puddles of nausea-producing slime. The houses were filled with it. The streets were filled with it. The only living things that were unaffected were the Yeast Men waiting for their turn to die. With sightless faces they shuffled along the streets passing unconcerned through the decayed bodies of their brothers with apparently only one idea—to keep moving till death came to enable them to add their bit to the defence of their country.

The people fled. Sick and sweating, pale-faced and gasping, incapacitated and vomiting, they ran from the terror. The army fled, cursing the Premier for thinking to feed them on such putrid offal. Nothing could hold them, or restore discipline. And around Moronia was a widening, desolate, deserted ring in which there was no living thing.

The people fled to the border. The neighboring Kingdoms, however, friendly as they were to Eupenia, thought of their own safety. In this strange vomiting, in the tales of delirium told by the first refugees, they thought they saw symptoms of a new and deadly contagious disease and at once threw a line of bayonets along their borders and forbade emigration from the stricken land.

Eupenia deserted her Capital without shedding a drop of blood.

Premier Plautz, as soon as he had sufficiently recovered from his own personal vomiting, to consider the matter, called a meeting of his Staff and ordered the advance to begin against the enemy. This, he said, was only a new method of conducting war. Were they to be conquered by smells or inert lumps of yeast? Let the artillery blow them to pieces. Let the cavalry cut them to pieces. The infantry could build fires and burn them. A faithful remnant of the once proud army attempted to follow out his orders but no soldier, however brave, can continually fight on an empty stomach, and no officer, however capable, can give orders while constantly vomiting. The army, from the General-in-Chief down to the privates, were continually sick with the sickness of Jonah's Whale.

The whole resistance was hopeless. The Yeast Men arrived day after day in increasing numbers and they could not be killed. They could be mutilated, dissevered, decapitated, but each piece lived and moved onwards.

Efforts at their destruction only added to the horror, and put the finishing touch to the destruction of morale.

What use cutting a thing to pieces when each piece kept on living and advancing? How could an enemy be killed when it could not bleed?

Eupenia was hysterical.

On the sixth day, the army revolted, killed Premier Plautz and declared the Kingdom a Republic.

Immediately they sued for peace by radio. Moronia suspected a trap and refused to grant an armistice. Her guns continued the deadly shower. Finally, on the tenth day of the unequal struggle, peace was declared.

Afterwards, the world blamed Moronia for not granting an immediate armistice, but it is only fair to her to say that she did not know the full horror of the war at the time and never did realize it as the Eupenians did. She was anxious enough for peace, but she wanted a peace that would be permanent.

But Eupenia not only wanted peace, she wanted help to rid her of the millions of tons of terrible end-slime. Mr. Billings was called in for advice. He laughed at the question.

"The smell only lasts for ten days," he said, and then dies out and the slime simply becomes a highly concentrated manure, more rich than any commercial fertilizer that we have yet discovered. The fields of Eupenia will be the more fertile because of this manure. Tell the farmers to be patient and hopeful. They will have fine crops next year. The city people can shovel it up for their window boxes: it will grow wonderful violets."

Later on, at the close of the Peace Festival, Mr. Billings was decorated. The little old King, Rudolph Hubelaire, put his one arm around the inventor and kissed him on both cheeks. Then he pinned the decoration of the Golden Moronian Eagle on him, while the people cheered.

"I want to raise your salary," said the King.

"The only rays I am interested in," replied the inventor, who had not been paying much attention to what the King was saying, "are the light-and energy-rays. I have another idea about them which I think I can work out if you will let me have some money for my experimentation."

"You can have all the money you want!" was the King's eager answer. "But tell me one thing. What made those Yeast Men grow and move the way they did?"

"It was like this, Your Majesty. They were just yeast cells but they were filled with a special dynamic energy, a very special form of energy. I could tell you all about it, but I am afraid that it would be hard for you to follow my technical explanation."

"I know I couldn't," laughed the King. "I wish you could put that kind of energy into my people. We could win the commerce of the world. But I suppose you can do things with yeast that you cannot do with human beings. Now let us go to the banquet. The people are anxious to hear you."

And Mr. Billings of the United States of America said to Rudolph Hubelaire, King of Moronia,

"I am not very good at speechifying."

THE END.

The WAY OF A DINOSAUR

by Harley S. Aldinger

It had an abnormally long neck, with a head at the end so small that it looked like a mere continuation of the neck . . . Cayna charged forth, and, leaping upon the mountainous back, buried his great fangs in the thick rolls of flesh at the base of the neck . . .

A MIGHTY tree in that great primeval jungle of the Mesozoic age was pushed aside, as you or I might lightly push aside a willow bush, and the terrifying head of Cayna, the tyrannosaurus, King of the Jungle, was thrust through.

His little, red-rimmed, cold, reptilian eyes were blazing with hate and menace, for Cayna was in another of his blood-rampages that day, and woe betide the unlucky animals whom he encountered, no matter what their size and strength might be. It was a blood lust of a fierceness and wantonness, to which only Cayna could attain.

As the battle-scarred old warrior stepped out from behind the tree, he presented a frightful and menacing sight. He towered fully forty feet high, with great jaws four feet in length set in his massive head, with fangs six or seven inches long, and supported by his mighty hind limbs, which could send him forward with great leaps and bounds, at need, with the speed of an express train. He had a massive tail, fully forty feet long, gigantic at the base, and tapering gradually to a small tip; a terrible engine of destruction. The tyrannosaurus, in fact, is known as the most destructive living thing that ever existed. Cayna's comparatively small forelegs were armed with rending claws.

IT is always interesting to imagine what our earth looked like millions of years ago; before man had appeared, the time when the giant animals of the Mesozoic Age were roaming over our planet. How did they live, and what did they do? Our new author has developed a charming tale, based upon accurate scientific knowledge, a story that despite its shortness, is highly interesting and gives us an excellent idea of the past and bloody age.

He strode through the giant trees with his body bent forward at an angle of about forty-five degrees, with small eyes searching malevolently for some opponent, against whom to pit his mighty thews and destroying armament. His huge mouth was half open, and from time to time he emitted thunderous roars and screams of defiance.

The other animals knew from these sounds that the mighty king was abroad, and thirsting for blood, so everywhere he found all game departed from his path.

Becoming more cunning, but no less fierce or relentless in his **blood**-hunt, Cayna **ceased** his r o a r i n g and **screaming**, and crept s t e a l t h i l y through the jungle, soft-footed as a cat.

As he did so, he saw, not a hundred feet away, a giant pterodactyl, a great, winged reptile with bat-like, featherless w i n g s, having four legs, each terminating in four fingers, one of which was fastened to the wings. That is how they derived their name, "wing-fingered." It had a short head and a beak, filled with needle-sharp teeth. He saw it swoop down and seize a small mammal about the size of a sheep, and drawing the struggling animal into the air, plunge its mighty beak into the base of the neck. With a shrill cry, the mammal grew limp in the pterodactyl's wing-fingers.

Burdened by the heavy load, the reptile flew heavily, just clearing the treetops. He had gone about a hundred feet, when a mighty head was upreared over the tree tops, mighty jaws yawned cavernously, and the great bird-lizard and its prey were crunched together in the grinding jaws of the flesh-eater.

Having finished his repast, Cayna set forth again to see what new adventure the day would bring him. He did not have to look far.

Out into a small clearing stepped an animal which resembled a living Gibraltar. It traveled on all fours, but its hind limbs were four times as long as the forelegs, so that its nose almost touched the ground. It stood sixteen feet high at the thighs, was covered with hard, bony, plates, except on the underbody, forming an impenetrable armor. From the base of the head, over the back, and halfway down its tail, was a succession of bony plates in double columns, and varying in height from a couple of inches to three feet, each razor-sharp at the edges, and coming to a sharp point at the top. The head was very small, and triangular in shape, with small eyes, and a mouth that cleft back past its eyes. Its monstrous tail was its one means of offense or defense. Enormous at the base, (fully ten feet in diameter,) it tapered gradually for its whole length of twenty-five feet, and ended in a very blunt tip. Where the bony, finlike, plates had ended in the middle of the tail, a series of four pairs of extremely sharp, conical, spikes, of about two feet in length, began. When the stegosaurus lashed out with this spiked tail, it would produce the same result, as if you hit a person with a board through which a series of nails had been driven.

This, then, was the monster upon which the flesh-eating tyrannosaurus looked. Ordinarily, in the presence of other, and more easily conquered game, he would have passed the stegosaurus by, for the "Plated Lizard" was regarded by the other dinosaurs in the same way as the present animals regard a porcupine. But Cayna was in no mood to pass anything by with which he might do battle.

So, with a mighty roar, he charged the armored dinosaur, lashing out at the other's head with one of his smaller forelegs. But the stegosaurus had anticipated the movement, and had drawn its head inside its armor, like a mud-turtle, and the blow only scraped the impenetrable plates on its neck.

Thus they jockeyed around for some moments, the tyrannosaurus always being careful to keep at the other's head end, out of reach of the destroying tail, and the stegosaurus endeavoring to wheel and strike a bone-crushing blow with his spiked appendage.

But the old king had not survived many fierce battles by sheer luck. He resorted to strategy. Striking a slow, hesitating blow toward the other's concealed head, he induced the sluggish giant to strike at it. This it did, and when its head was fully out, the wily monarch lashed out, carrying away the right side, and one eye, of the "plated dinosaur's" face.

Screaming in amazement, the great stegosaurus reared up on its hind legs. It was the opening for which Cayna had been waiting. Leaping forward, he sized the other's neck with both forepaws. Then, supporting himself with his tail, he swiftly disemboweled the other with his immense hind legs. The great tail of the stegosaurus lashed convulsively for a few seconds, then was still, and the flesh-eater dined well.

HAVING satisfied his hunger, but not his blood lust, Cayna went forth again, until he arrived at a rather small plain. Nearby, alongside a great boulder, was a huge bull triceratops, snorting and pawing the earth savagely. He was evidently an outcast from a vast herd which could be seen in the distance, stretching as far as eye could reach, countless thousands.

The triceratops was about eleven feet tall at the thigh, where, like the stegosaurus, he was the tallest. However, his forelegs were not nearly so short, in comparison to the hind legs, as were the stegosaurus'. He was, also like the stegosaurus, covered with hard bony plates or knobs, which served him as armor. He also possessed a bony frill about his neck, which gave him the appearance of a Roman gladiator. He had, characteristic of a dinosaur, a great tail, enormous at the base, and tapering gradually. Three horns and a parrot-like beak completes his description. One horn over the nose, was about a foot and a half in length, and the other two, one over each eye, four or five feet in length. And all three were of needle-like sharpness. A monster worthy of the gigantic Cayna's best efforts.

Charging, with a roar, out into the open, the tyrannosaurus leaped upon the "three-horns" back, endeavoring to sink his giant fangs through the impenetrable armor. But his efforts were unavailing.

The triceratops, with an impatient shake of its mighty frame, hurled the tyrannosaurus from its insecure hold, up against the great boulder. Then, whirling rapidly, it sank its shorter nose-horn its full length into the tyrannosaurus.

The old monarch, in desperation, seized the other two great horns of the triceratops in his smaller forepaws, and forcing the great head down, thus originated a hold which rendered the other helpless.

The triceratops, bellowing insanely, continued to gore and slit the tyrannosaurus' flesh to ribbons, with his nose horn and parrot-like beak, but was unable to inflict a fatal wound. But in spite of his terrible punishment, the tyrannosaurus continued to force the great head downward; and finally it touched the ground. Then, screaming in triumph, he sank his great fangs into the now unprotected neck, crunching it until he severed the spinal column, and the horned giant fell dead at his feet.

But the old king had not escaped unscathed, and he was bleeding from a score of wounds, so, no sooner was his adversary dead, than he hurried away to a little pool he knew of, to lick and bathe his wounds. He was chastened in body, but not in spirit, and his two previous battles had only caused the flame of his blood lust to burn more brightly.

After perhaps an hour of bathing and licking his wounds, Cayna ventured forth once more, coming finally to a pebbled beach by the great sea water.

He found a gigantic brontosaurus basking at full length upon it. Of all the colossal dinosaurs, there were none so huge as the brontosaurus, excepting the diplodocus, a creature greatly resembling him.

A great monster, about seventy-five feet long, standing sixteen feet at the thigh (where, a characteristic of a dinosaur, it stood the tallest), and weighing nearly forty tons. It had no system of

offense or defense, except the great tail, eight feet in diameter at the base, and trailing out behind for sixty or seventy feet. It had an abnormally long neck, with a head at the end so small that it looked like a mere continuation of the neck.

This, then, was the creature upon which Cayna charged forth, and leaping upon the mountainous back, buried his great fangs in the thick rolls of flesh at the base of the neck, and ground steadily downward in a search for the spinal column.

The monster, at the first attack, had leaped, screaming shrilly, into the air, for all its great weight. It bit, ineffectually, at the tyrannosaurus' heavy hide, with its small, frail teeth, and lashed at it with its heavy tail. The last, however, was not entirely ineffectual. The whip-like tip cut the tyrannosaurus' back to ribbons, but the great saurian was unable to reach the other with the heavier part of its tail, or Cayna's story would now be over.

In desperation, the monster finally charged out into the sea, where it was infinitely more agile than on land.

Charging out swiftly, he reached deep water, and started to roll over on the tyrannosaurus. But it was never accomplished, for at that moment, Cayna's six inch fangs ground home, and the brontosaurus rolled over on its back, dead.

The hideously mangled, but victorious king, after having assured himself that his adversary was dead, began to swim slowly toward the shore. But he never reached it.

For, at that moment, an ichthyosaurus, a thirty-foot, saw-toothed jawed, sea-dinosaur, swept up from below and buried half its saw-like jaw into the tyrannosaurus.

Whipping frenziedly about, the great saurian bit the ichthyosaurus' head entirely off, in his rage, but at that moment an entire school of the bloodthirsty fish-lizards swept up, and the tyrannosaurus disappeared in a boiling, bloody, inferno.

And thus Cayna, the king, went the way of a dinosaur, meeting the fate of all the bloodthirsty breed, sooner or later.

THE END

What Do You Know?

READERS of AMAZING STORIES have frequently commented upon the fact that there is more actual knowledge to be gained through reading its pages than from many a textbook. Moreover, most of the stories are written in a popular vein, making it possible for 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 were the two great types of animals which, in ancient times, seem to have ruled the earth? (See page 49.)
2. How may man's size be stated with reference to insects and saurians of pre-historic ages? (See page 49.)
3. What is the family name of the stag beetles? (See page 51.)
4. What are the estimates of the age of the earth? (See page 63.)
5. Can you give the titles of four great geologic ages? (See age 63.)
6. How far back may we estimate the Mesozoic Age to have been? (See page 63.)
7. What is the name of one of the methods astronomers use for computing time? (See page 73.)
8. When Mars is in opposition to the Earth, what is the relation of the earth to the Sun as it would be seen from the planet Mars? (See page 75.)
9. Can you give examples of an exothermic chemical reaction and of an endothermic chemical reaction? (See page 76.)
10. Can you give some names which astronomers have given to geographical features of Mars? (See page 78.)
11. The late astronomer Lowell gave great study to Mars. Do you know what his views were about the water supply of the planet? (See page 79.)
12. What is the name of this author's book on the canals of Mars? (See page 79.)
13. What is the period of the two little moons of Mars? (See pages 81 and 45.)
14. What is the diameter of the moon? (See page 40.)
15. How much would a 170-pound man weigh upon the moon? (See page 40.)
16. How many canals have been catalogued on the planet Mars? (See page 42.)
17. What is the longest of the canals? (See page 42.)
18. What are the "oases" of Mars? (See page 42.)
19. What are the interesting details about the sizes and motions of the two moons of Mars? (See pages 45 and 81.)
20. What did the *Challenger* expedition teach the scientists about life in the extreme ocean depths? (See page 46.)
21. What do you know about the great French astronomer, Leverrier and Neptune? (See page 47.)
22. What animal of geological times is supposed to have been the most destructive living thing that ever existed? (See page 35.)
23. What is the origin of the name *Pterodactyl*? (See page 35.)

BARON MÜNCHHAUSEN'S SCIENTIFIC ADVENTURES

by Hugo Gernsback

5. Münchhausen Departs for the Planet Mars.

ONCE upon a time, a grouchy young gentleman with a grievance for fiction writers, probably because they received more emoluments for their stuff than he did for his poetry, thus vented his resentment in immortal song:

"'Tis strange, but true; for truth is always strange —stranger than fiction."

From this, some coarse soul, totally oblivious of any poetic infection, took it upon himself to mutilate the above passage of one of Lord Byron's poems and taught us unsuspecting mortals to say parrot-wise, ever after until the end of fiction, thusly: "Truth is stranger than fiction!"

With all due regard to the memory and genius of Byron, I, I. M. Alier, a citizen of a free country, take it upon myself to correct his Lordship at this late and quarrelsome date, to wit:

"There is no fiction."

If, as it has often—no, always—been proved that the most fantastic fiction at some time or other invariably comes true, then by all processes of modern logic, there can be no such thing as fiction. It simply does not exist. This brings us face to face with the startling result that if fiction always comes true some time or other, why then, bless their dear souls, all fiction writers must be prophets! Hurrah for the F. W.'s! But hold on, boys; don't let our enthusiasm run away with us. While it is nice to be a prophet, don't forget that a prophet is never, never recognized in his own country. Thus the New Testament teaches; so I think it will be safer for all F. W.'s to remain F. W.'s, rather than become honorless prophets.

However, that is not what I had in mind when I started—it's so hard for me to say what I mean, and a good deal harder for me to keep my thoughts running on the track. They ramble from one nothingness into another. My mind, in that respect, is a good deal like a one-eyed, religious old cow on a pasture. She eats up whatever she sees alongside of her, but when she finally turns around, she perceives, with astonishment, that there is still a lot to graze on the other side; so she steers around to starboard and returns to her original starting point.

But I am rambling again, so let's return to the place we started from.

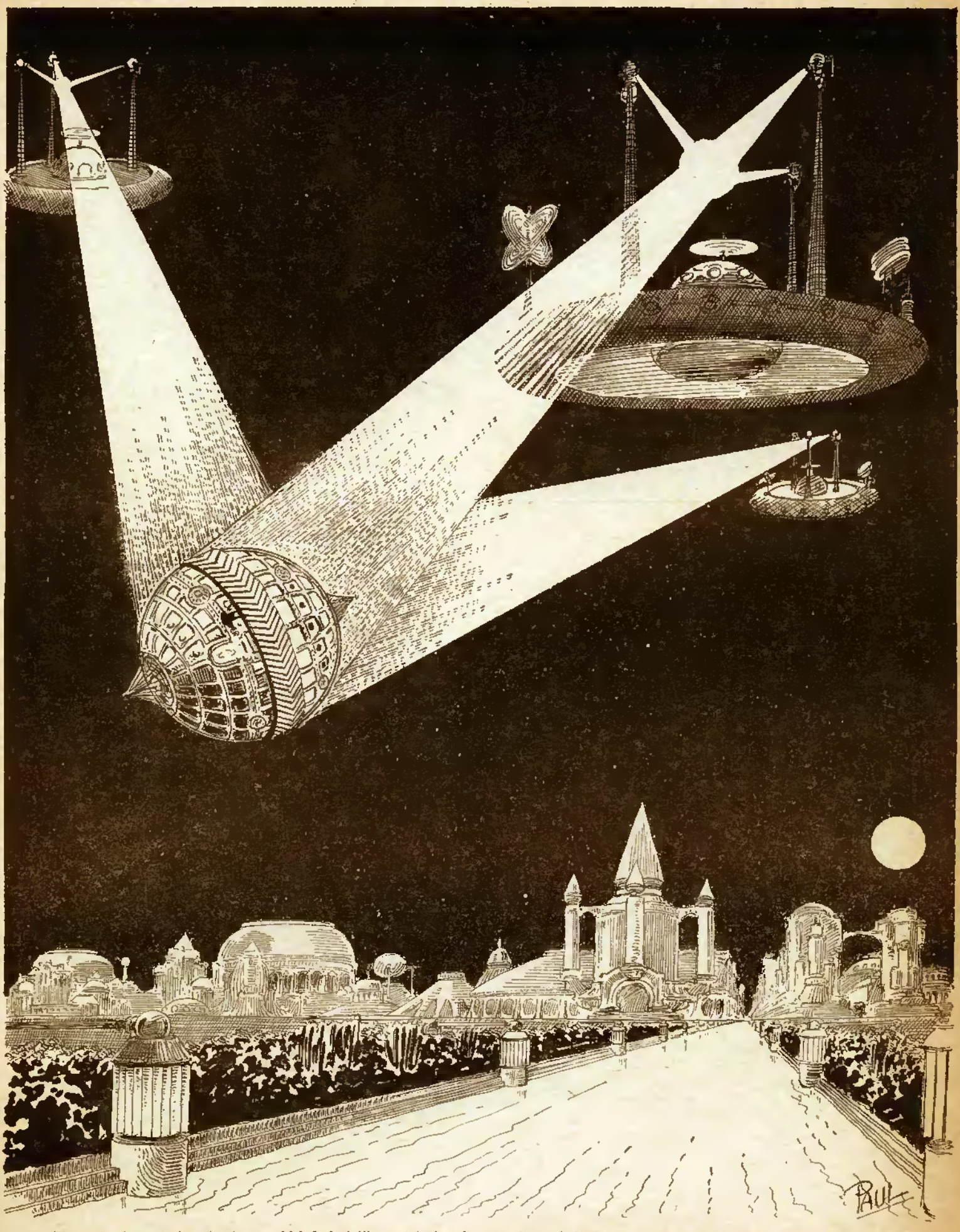
Seriously speaking, and by way of emphasizing how much stranger truth is than fiction, I have but to point to Jules Verne's famous stories. Fifty-eight years ago when he wrote "Twenty Thousand Leagues Under the Sea," no one took him seriously. It is doubtful whether he himself believed that the submarine which he invented in that story would ever become practical. It was just fiction. Yet forty-five years later, a submarine, almost exactly like the one his vivid and prophetic mind conceived, emerges from a German harbor and travels under its own power over a distance of 4,000 miles, through the North Sea, the English Channel, down the Atlantic, through the entire length of the Mediterranean and up through the Dardanelles to Constantinople! And by way of diversion it manages to sink several battleships of the enemy by means of its torpedoes. Now, bold as he was, Jules Verne never conceived such an "impossible thing," and while his famous *Nautilus* was equipped with almost every other modern submarine necessity, the infernal automobile-torpedo was missing. Truth is indeed very much stranger than fiction. But I mustn't ramble.

Münchhausen, as will be remembered, had explained the mysteries of the moon to me, and he had also mentioned the great danger of falling meteorites which had been increasing alarmingly in number for some time. The moon's attenuated atmosphere offers no protection from meteors, as does the earth's thick air. But few meteors ever reach the surface of the earth; the intense friction between the meteor and the air ignites the former, and most of it falls as a fine dust. The burning of the meteors represents the shooting stars we see. On the moon, however, the meteors crash down bodily, causing tremendous havoc, and this terrible bombardment goes on forever without let-up.

Consequently, when Baron Münchhausen stopped short that evening in the midst of a sentence, I naturally was alarmed not a little. Great was my joy, therefore, when, sitting before my radio set the next evening, 'phone clapped tight over my ears, my eyes glued on the clock, the familiar high, whining spark suddenly reverberated in my ears at the stroke of 11 o'clock.

It was Münchhausen. But his usual sonorous voice to-night had an unfamiliar metallic timbre that puzzled me greatly; in a short time, however, the mystery was cleared:

SHAKESPEARE, the master of the drama, never conceived anything like a drama of an entire world—millions of intelligent beings—fighting a heroic battle—a battle for existence. Yet this drama was going on right before his very eyes, but 35 million miles away; for the Martians have been fighting for water ages ago, and the available supply becomes smaller each year. There is nothing more inspiring, nothing more gripping for the imagination, than this wonderful battle between organized intelligence on one side ad unrelenting nature on the other. Baron Münchhausen's scientific lecture gives you the latest facts—now almost universally believed—about Mars. You can spend no better half hour than turning your mind from your humdrum existence towards a subject which is as absorbing as this.



Three circular, massive structures, which looked like metal aircraft, spaced equal distances apart, were floating in space. The three flyers marked an equilateral triangle while in the exact center, but about one mile lower down than the flyers, our *Interstellar* was floating. Three shafts of an intense yellow ray were turned on us, and it was this light, or rather the peculiar properties of the rays, which had made us captives to the Martians' superior intelligence.

"My dear Alier. No doubt you thought I had been killed by a meteor last night. Well, as you Americans put it, I certainly had 'a close shave.' A meteor crashed down on my aerial 50 feet from where I was sitting; of course it went up in smoke—metallic vapor, to be correct—due to the tremendous heat generated by the impact of the meteor on the granite rocks. The meteor went up in a fiery cloud of red vapor and I was blown headlong a distance of over 50 feet, right down into the mouth of a giant crater, by the resulting blast of the concussion.

"This long-extinct crater is a very deep one; how deep, I was soon to learn! I went down head first and kept on falling down that abyss at a terrific rate of speed, for what seemed to be hours. As I kept on plunging down, I was gloomily reflecting what an inglorious end it was, to die at the bottom of an unromantic crater on a dead and dried-up moon. I thought of many things, when I suddenly became conscious of a frightful cold. Call it instinct or presence of mind, or what you will, but, as soon as I had started on my downward journey, I had jerked my body in such a manner as to righten it; in other words, after a few attempts, I succeeded in falling feet down. It was indeed a fortunate circumstance that the sun was almost directly over the crater, for it saved me the anguish of plunging into a pitch-black abyss. While it was not nearly as light as it was at the top, still I could see where I was falling, and that was some consolation. Thus, when I glanced down toward my feet after a while, I am sure that my heart, which had lost some beats, stood still entirely. It took me a few seconds to collect my bewildered senses, for this is what I saw:

"The crater had no bottom at all; it went right through to the center of the moon, where it connected with another crater, which went to the opposite side. I knew this must be so because when I looked down I saw several stars shining through brilliantly from the night side of the moon. Then the awful truth flashed through me and I almost swooned. I was falling through the whole diameter of the moon! I had been in many tight quarters before, during my somewhat exciting career, but this experience indeed bade well to be the inglorious end of my adventurous life. However, my far-famed presence of mind and my cool head soon asserted themselves, as was naturally to be expected of me.

"I knew the diameter of the moon to be 2,164 miles. A quick mental calculation proved that it would take my falling body about 24 minutes to reach the center of the moon. As there was nothing to stop my fall, I must naturally continue to fall, due to the tremendous momentum acquired, till my body would have fallen for 48 minutes. If I could not manage then to grasp a projecting rock, I would commence to fall back again toward the center of the moon. I reasoned that once more my momentum would carry me past the center and I would then be almost carried to the mouth of the opposite crater—my original starting point.

"I say almost, for the friction of my body against the air would tend to retard my fall. If at this point, where my speed was again zero, I could not succeed in taking hold of a projecting rock of the crater's side, I would begin to fall down once more, the same as before. I would then continue falling back and forward exactly like a bouncing ball, each time, however—just like a rubber ball—a little less than on the previous plunge. Thus my drops would become of shorter duration, and finally I would fall no more.

"As I had mentioned before, the sun was almost overhead, shining down into the crater. I also remembered that it was almost exactly 12 o'clock midnight, terrestrial time, when the meteor smashed my aerial; this, then, was the time I started on my remarkable journey into the bowels of the moon. With a tremendous effort I pulled out my chronometer and noted that it was 12.23 a. m. In another minute I would fly past the center of the moon. Looking about, I saw in the uncertain light that I went whizzing through an immense hollow, proving to me that the center of the moon was far from solid, due no doubt to the centrifugal force of the moon at the time when it had not solidified, some millions of years ago. I estimated later that the moon was an immense hollow sphere with a solid crust about 500 miles thick. By way of a homely comparison, the moon therefore must be a hollow globe like a rubber ball. And like the latter, it is filled inside with air, while its crust can be compared to the rubber of the ball.

"In another minute I had passed the center and was now dropping toward the other side of the moon. If I continued falling in my present position, I must naturally emerge at the opposite side with my feet toward the sky, as a little reflection will reveal to you. So once more I jerked my body about, and I was falling 'up,' with my head at the top, my feet pointing to the sun. At the end of another 24 minutes I could feel my body slowing up from the terrific speed. As the crater at this side of the moon was fortunately rather narrow, I found little difficulty in reaching for a projecting rock as soon as my plunge had come to a dead stop. I held on for dear life and clambered up a narrow ledge, where I fell down exhausted and panting from my dreadful experience.

"YOU would, of course, like to know my sensations in falling through 2,164 miles of space, going over 16 miles per second at the center of the moon. Well, the first minute it is rather unpleasant. Highly so. The place where your stomach should be by right is one vast area of nausea. But once you become accustomed to it, it becomes bearable, for there is nothing else to do. You might think that the rush of air would kill you in a few seconds, or else draw all the air out of your lungs, and thus asphyxiate you. But neither is the case, for the air is so thin on the moon that the rush is not as terrific as it would be on earth. Also, by keeping the mouth tightly shut and breathing—with difficulty, it is true—through the nose, one does not die in 48 minutes. The friction of the air against my body did not ignite either, for, as I told you some time ago, the temperature inside the moon is near the absolute zero, the awful cold of the stellar world. But neither did I freeze to death, for the simple reason that the friction of my body through the attenuated air was just sufficient to keep me comfortably warm. Thus you see, that if it had not been so cold, I would have burned up; and, if the friction of the air against my body had not heated it, I would have frozen to death long before I reached the center of the moon. Then, too, another important point to consider is that on the moon, as I explained before, my body weighed 27 pounds, against 170 pounds on earth. This is, of course, a rather small weight, and for that reason my fall was not as terrible as it would have

been if my body had weighed 170 pounds, as it did on earth. For that reason, too, I was not attracted so much to the sides of the crater as I would have been otherwise. Also it was fortunate that the two craters widened out considerably the further down they went into the moon's interior. As a matter of fact, the 'hole' of each crater at no point was less than three miles in diameter. This was indeed very lucky for me, for the following reason:

"If we drop a stone into a very deep and narrow shaft, this stone will never reach the bottom, as has been shown experimentally on earth. Instead, it will bury itself in the eastern wall of the shaft long before it gets near the bottom, providing the shaft is deep enough. The explanation is that the earth rotates on its axis from west to east at a speed of 1,524 feet per second at the equator. Thus it is apparent that the earth revolves more quickly than the stone can fall in a few seconds.* It therefore intercepts the stone's flight, with the result that the stone must of necessity strike the eastern wall of the shaft. This phenomenon is termed 'the falling of a body toward east.'

"Now, precisely the same condition exists on the moon, of course. Fortunately, I started falling at the western side of the crater, but as the latter was so wide, I never came near enough to its eastern wall to hit it. Likewise the other crater, at the opposite side of the moon, measured some four miles in diameter and, while I finally did reach the eastern wall, my flight had come to an end as explained already. Indeed, nature favored me all through, for the moon rotates with a velocity of but 15 1-3 feet per second at its equator, against a tangential speed of 1,524 feet of the earth. For this reason there was no danger that my body would collide with the sides of the crater somewhere in the interior of the moon.

"But in the meanwhile my troubles were far from being terminated. No sooner had I regained my breath than I became conscious of the terrible cold; for I was now but a few feet from the surface of the moon, on that side which was turned away from the sun, where only icy cold, darkness and desolation reign. Aside from this, I was some 2,160 miles away from Flitternix, my companion, and our *'Interstellar.' Walking around half of the moon was out* of the question; neither could I stay where I was without freezing to death. So I climbed up to the surface of the moon with considerable effort. Then, by the aid of the starlight, I ran rapidly around to the western side of the crater, for I had to run in order to keep warm. After having obtained my bearings by the aid of the stellar constellations, to make sure that I was at the western side of the crater, I took a deep breath, looked down in the abyss through which the sun was shining from the other side, and dived head down into space once more.

"You see, I had reasoned that it was far better to attempt the flying journey through the moon once more than to perish with the cold on the dark side of the moon. Besides, I had experience now and, having been successful once, it was natural that I should expect success again. I had nothing whatever to lose, and everything to gain.

"My first experience was repeated without any incident; furthermore, I calculated that I should land at the eastern wall of the far crater within 48 minutes, if everything ran smoothly. But I had left our good old sun out of my calculations. You see, the gravitational attraction of the sun controlled the fall of my body in the same proportion as it controls the rotation of the moon, of the earth and of other planets. I mentioned how, in my former flight, I had risen to the top of the moon; as a matter of fact, somewhat higher, for the opening of this crater was higher than the surface of the moon. But now I was falling toward the sun, and the sun was aiding and accelerating my flight; for I moved constantly nearer to it.

"For this reason, at the end of 48 minutes, I did not strike the eastern end of the crater. Instead, I whizzed right past the eastern wall, almost brushing it, and continued to rise up into the air about 100 feet, before my speed was spent. I promptly prepared myself to plunge down into the crater again. Indeed, before I realized it, I had begun to fall down once more, when the unexpected happened.

"I suddenly felt a rope encircling my body, and before I had time to think, I was jerked sideways, In another second I had fallen on a heap of sand and was looking with astonishment into Professor Flitternix's eyes!

"THIS is what had happened: Flitternix had, of course, seen me fall into the crater, and as he had rushed to the edge, he had seen how I dropped down with lightning speed. Looking closer, he also noticed what I saw, namely, that the crater went right through the entire mass of the moon, for he could see the stars shining through from the other end. He was loath to believe that the fall would kill me, and, as a scientist of note, he calculated exactly, in advance, what was likely to happen to me. He reflected that it would take me some two hours to make the round trip, as he knew that I could not possibly stay at the other side of the moon. He reasoned, correctly, that in case I was not killed, I would come swinging through the crater in due time. Unperturbed as he is by such mere details, he went to the *'Interstellar'* and had his lunch. Within two hours he returned to the crater, armed with a telescope and a long rope. It did not take him long to locate me down in the abyss by means of his glass, for I was rapidly coming to the surface then. Attaching one end of the rope to a near-by rock, he fashioned a sliding noose on the other side and waited.

"Now it must be said to the credit of Flitternix that in his younger days he had lived in the West on a ranch, and there had become an expert in the science of lassoing. He boasted that once he lassoed a common sparrow by its left hind leg, but this I believe to be somewhat exaggerated. Be that as it may. When I finally emerged to the surface, a living piece of lava ejected out of an extinct crater, Flitternix had little trouble in lassoing me as I came whizzing up.

"I thanked him and asked him if lunch was ready, for the trip had given me quite an appetite, as you may well imagine. Luncheon over, we decided right then and there to quit the moon, for Flitternix, as well as myself, were of the opinion that there was little further to be explored on this dead world. Besides, the meteors had become so alarmingly frequent that it would be only a matter of time when one or both of us would be killed.

* The speed of a falling body at the surface of the earth after the first second is 16 1/12 feet. In six seconds a stone would have traveled but 579 feet.

"Flitternix wanted to return to earth at once, for he itched to give a lecture before the American Astronomical Society, whose honorary president he was. I, however, had more ambitious plans. I once had looked through the great telescope of the Lowell Observatory at Flagstaff, Arizona. If I live to be a thousand years old, I will never forget the glorious sight which then presented itself to my eyes.

"I saw a ball, lighted up dazzlingly at both extremities. I saw great patches of an ochre red scattered over the surface of the sphere and I had seen dark blue areas among the vast ochre patches. Over the latter runs a mass of fine lines, nearly all of them connecting with the white caps at each extremity. Moreover, these fine lines cause one to gasp involuntarily, for they are as straight and true as if laid out with a rule and pencil. More astonishing yet, some of these lines run absolutely parallel with other ones for the whole extent of their length. And more wonderful still, whenever two or more lines meet in a junction, there is invariably, a round black spot.

"The ball which held me transfixed for a long time was Mars, the nearest planet to earth, then 37,000,000 miles distant from your sphere. The late Prof. Percival Lowell, the great authority on Martian research work, had convinced the scientific world that the dazzling white caps at the poles of this planet are the polar snow fields. The great ochre patches are desert land, while the dark blue areas represent large tracts of fertile land and its resulting vegetation.

"Now, according to well-known physical laws, proved beyond discussion, the smaller a body, the quicker it will cool off. All planets and their moons once were white-hot like our sun. The smaller ones cooled off first and the larger ones are not cold yet. Thus the earth, which measures 7,912 miles in diameter, is still red-hot in its interior, as is proved by its active volcanoes. The moon, which is but 2,164 miles through, cooled off ages ago. The oceans once filling their beds then filtered down into its bowels, there to freeze solid, for there was no heat to keep the water fluid. Its atmosphere, which was formerly as dense as that of our earth, was gradually thrown off into space, till to-day practically no atmosphere remains. Thus the moon rolls on through space, a dead world.

"The planet Mars, measuring 4,339 miles in diameter, as will be seen, is only twice the diameter of our moon and much smaller than the earth. Consequently it must be rapidly nearing its extinction, just as the moon has done. Its oceans are already dry, and most of its land is desert. Practically all the atmosphere has gone too, which is proved by the fact that we seldom observe clouds on Mars through the telescope. But there must still be water on the planet; this is irrefutably proved by its polar snow caps. This view is further strengthened by the fact that these caps undergo seasonal changes. As the sun beats down upon them, we see first the one, then the other, grow smaller in size, till at the end of the Martian midsummer, the northern one has disappeared almost entirely. During the next hot season, the same happens to the southern one. Where has this water—the only remaining water on Mars—gone? It cannot have filtered into the interior, for if it had, we could not possibly witness the reappearance of the polar snow fields every Martian year, as we actually do. Where, then, does the water go?

"DR. LOWELL solved the problem in a brilliant, as well as ingenious, manner.

"His view—and it is shared by most of our scientists to-day—was that Mars is inhabited by a thinking people, fighting an heroic battle for their existence. Without water, life, as we know it, cannot exist. Now, ages ago, the shortage of water had made itself felt on Mars. Long before the first caveman appeared on earth, Mars had been an old world, where civilized peoples had reigned for centuries. While our ancestors were still jumping from limb to limb among the trees in primordial forests and jungles, the water problem on Mars had become acute. The fertile lands were fast turning into deserts, for rains had become more and more infrequent, until they had stopped almost entirely. Furthermore, as Mars is flat, practically without mountains of any sort, there could not be any natural rivers to convey the water to the plains and valleys as is the case on our world. The Martians, seeing utter extermination staring them in the face, proceeded to save their race. They did precisely the same thing that we are doing in Western America and the Egyptians and English are doing in Egypt, namely effecting the irrigation of deserts or semi-deserts on a large scale. Our recent Roosevelt dam in Arizona offers a good example of this. Our engineers on earth have to bring the water to the deserts, precisely as the Martian engineers must have been doing for centuries past.

"On earth, however, this is a comparatively simple matter, for here we have rivers and lakes in abundance which can be tapped with ease. Not so on Mars. The only remaining water there is found around the poles; by sheer necessity, therefore, the Martians had to go to the poles for their water supply, and this is exactly what our telescopes reveal that they did. For the long unswerving straight lines which we see are part of the canals bringing the water down from the poles to the desert land, there to irrigate it. So far, the Lowell observatory has discovered almost 6,000 canals, but there are doubtless many more. They criss-cross the entire surface of the planet in every conceivable direction. Most of them, however, run due north and south in the direction of the poles. Not only do the canals cross the desert lands, but we see them carried bodily across the dark blue areas which we know to be irrigated vegetation tracts. The fact that the canals run across these areas is another proof that these areas are not oceans, as had been thought at one time.

"Now, the lines which we see running over the planet are really not the canals themselves, but are simply wide strips of vegetation fertilized and kept alive by the water from the canals. The average width of the canals proper, Dr. Lowell estimated to be about six miles. There are some of them, however, which are thought to be much wider than this. The length of these canals, however, is stupendous. There are some canals which actually measure 3,400 miles in length. A great many are over 2,000 miles long. Dozens of them run for 1,000 miles, and nearly all of the canals run in absolutely straight lines.

"The circular black areas, mentioned above, which we see almost invariably at the juncture of one or more canals, are termed 'oases.' They also represent vast tracts of vegetation and probably contain large cities, farms and so forth.

"Viewing Mars and its canals through a first class telescope, must convince the strongest opponent of Dr. Lowell's theory, that these wonderfully straight lines cannot, by any possible chance, be the work of Nature. The counterpart is found nowhere on earth, nor in the heavens. And if, for argument's sake, we consider these lines to be of natural origin, it is inconceivable that so many of them could join and meet as they do and form these exact circular areas. Their artificial origin is too apparent and cannot be otherwise considered to-day. Dr. Lowell's theory has so far withstood the onslaughts of nearly all opponents. As a matter of fact, his explanation is to-day accepted almost universally.

"But how do the Martians move the tremendous masses of water through their canals? Mars is entirely level, and water does not flow on a level surface without a 'head.' Moreover, during one season it must needs flow from the north towards the equator, when the northern polar snow cap melts under the influence of the sun's heat. During the next season, however, this flow must be reversed, for now the south polar snow cap melts with a resulting flow of the water from the south to the north.

"But how do the Martians succeed in moving the water? We don't know. Even Professor Lowell could tell us nothing on this point. Terrestrial science simply has as yet not advanced enough to offer an explanation.

"Well, to make a long story short, Flitternix and I decided to voyage to Planet Mars. My little astronomical lecture was given solely for the purpose of refreshing your mind about Mars in order that future reports which I shall make to you from the planet may be better understood by you and your friends.

"As long as our *'Interstellar'* was able to succeed in reaching the moon without mishap, I felt sure that the trip to Mars would not be an unduly difficult undertaking. Flitternix was of the same opinion. We calculated that the intervening 50 million miles separating the moon from Mars should be negotiated by our space flyer in thirty days, barring accidents. While this may seem like a short time in which to cover such an immense distance, our speed of 1,600,000 miles a day, or 66,666 miles an hour, is only a trifle greater than the speed of the earth (65,533 miles an hour) as it travels in its orbit around the sun.

"We immediately made our preparations and within six hours after I had emerged from the crater, the *'Interstellar'* had left the moon.

"And now for a little surprise! No doubt you noted that my voice does not sound the same as usual. You will have observed, furthermore, that I did not stop talking since I started. To break the news gently to you, I am not talking at all! While you are listening to my voice at this minute, I am some 1,100,000 miles distant from the moon, heading towards Mars.

"The explanation? Simple as usual!

"Before leaving in our *'Interstellar,'* we stretched an immense aerial inside of the canyon, the one of which I spoke to you several days ago. As you will remember, I told you then that it was open but a few feet across its opening at the top. It thus formed a long, narrow slit at the top, into which there was little likelihood of any meteor dropping, which could destroy the aerial. We stretched four wires in all along the inside of the canyon, spacing the strands six feet apart. Each strand is 6,000 feet long, which gives the required long wave length in transmitting as well as receiving impulses between Mars and the Moon, as well as between the Moon and the Earth.

"To this aerial I connected my latest invention, my *Inter-Planetarian Radiotomatic.* It is nothing but an ingenious adaptation of modern tele-mechanics and works as follows:

"WHEN the aerial receives a certain number of equally spaced dashes, an ultra-sensitive vacuum tube detector is actuated, which in turn operates a gas-valve relay. This relay then closes its contacts, which sets in motion the well-known telegraphone, invented by Valdemar Poulsen, the Danish Edison. A second ultra-sensitive detector, also connected to the aerial, is in series with the registering electro-magnets of the telegraphone; in front of these magnets runs the moving steel wire, on which are then recorded the impulses coming in over the aerial. You will observe that no message can thus be recorded unless the original key dashes unlock the telegraphone mechanism. At the end of the message, the same number of equally spaced dashes will lock the telegraphone mechanism. The recorded message is now ready for re-transmission at any time desired. This also is accomplished in a simple manner.

"I took our 300-day clock and fastened upon it a contact which would be closed at exactly 11 p. m. every night and would be opened again at 12 o'clock midnight. This contact closes a circuit in which is included the telegraphone mechanism. As soon as it starts, the steel wire with its recorded message begins to reel off in front of the two reproducing electromagnets, which in turn are connected with a special telephone receiver. Thus the telephone receiver will begin to talk its message (if one was sent during the day) every evening at 11 o'clock.

"But connected to the telephone receiver are several amplifiers, arranged in cascade. The last amplifier is attached to the mouthpiece of the transmitter of my wireless telephone. Thus the weakest recorded talk on the telegraphone wire will cause the telephone of the last amplifier to talk into the wireless transmitter louder than myself.

"Now my 300-day clock every night at 11 o'clock also closes the contacts of a powerful relay, which in turn operates the generating plant of my wireless telephone, disconnecting it at midnight. Therefore, when the amplifier with its telephone begins to talk into the transmitter of the wireless telephone, there will always be enough power to transmit it to you on Earth.

"As soon as we arrive on Mars, we will, in all probability, find all the necessary materials to erect a giant radio telephone plant, and if we succeed we will send daily messages to the Moon, and my radiotomatic relaying plant will transmit the messages to you every night. I might also mention that my ultra-sensitive detector contains two radio-active substances, making the detector such a marvelously sensitive instrument that it will work a set of amplifiers in cascade when an electric pocket buzzer is operated one hundred and fifty miles away from it, connected to the ground only and using no aerial!

"You might say: 'Why use the relaying plant on the Moon at all? Why not transmit from Mars to the Earth directly?'

"The reason is that when the weak impulses arrive from Mars, after having traveled from 50 to 60 million miles, they cannot be sufficiently strong to pass through the Earth's thick atmosphere which is always charged with electricity and static. It is far better that the weak impulses should operate the relaying plant first and send out from it very strong impulses which have to travel only some 238,000 miles to Earth.

"We tested the plant thoroughly, and after we had satisfied ourselves that it would work for at least 300 days, I opened the telegraphone circuit and began to register this message to you. It will be the last one which you will receive for 30 days or more. As it must take us from five to ten days to build a transmitting plant on Mars, you need not expect to hear from us for from 35 to 40 days. You might, therefore, commence to 'listen in' beginning with the 35th day from to-night. No message can ever be repeated, for the 'wiping' electro-magnets of the telegraphone wipe out the magnetic impulses from the steel wire as quickly as they pass the transmitting magnets. Neither can you transmit a message to me, for no provisions were made to relay your messages to us while on Mars.

"I will now bid you adieu, my boy. Think of us during the next 30 days! Good-bye—good-bye . . .!"

There was a silence for some seconds, and as I was still listening awestruck, I was suddenly startled by another voice:

"Hallo, there Alier, this is Professor Flitternix. How's Yankton? Beastly old town. Was once forced to sleep on a billiard table in the Palace Hotel, as all the rooms were full. The robbers charged me $2.50 for the 'room,' plus the regulation rate of 50 cents an hour for the use of the billiard table! Mean town, that Yankton! Well, good-bye . . ."

There was a snapping noise and the rhythmic, low, sizzling sound stopped abruptly. All was quiet once more.

6. Münchhausen Lands on Mars.

FOR forty-one days I had been "listening in" nightly at my wireless set, since that eventful evening when Baron Münchhausen had left the Moon for the planet Mars. He had said that it would take from 35 to 40 days before the *"Interstellar"* could negotiate the trip from the Moon to Mars, but nevertheless I became more and more impatient as the days wore on.

At last, on the evening of the forty-second day, at 11 o'clock on the second, the peculiar, unmistakable high whining spark suddenly broke upon my ears. After the long nervous strain, the loud whistling spark almost took me off my feet and I could hardly hear the first words for excitement. In a few seconds the whistling sound died down, and Münchhausen's dear, sepulchral voice sounded once more in my faithful receivers. And how loud it was! It was positively uncanny to think that I was listening to his "canned" voice, which, perhaps 10 or 12 hours before, had been hurled through the ether from Mars 55 millions miles to the Moon, there to be registered phonographically on a telegraphone wire. And now the Baron's voice through the radio telephone sending plant on the Moon, 238,000 miles away from me, was talking! The thought made me shiver.

"Hello, Alier," it came in a sympathetic voice, "how is old Mother Earth and yourself? Too bad there is no return 'circuit,' for I would love to hear your dear voice. It's over 44 days since I last heard it. But it can't be helped. You must be satisfied to listen to me, without being able to talk back; but I'll try to be as explicit as possible, so that you will not feel the need of asking questions.

"Well, my boy, the trip from the Moon to Mars was entirely uneventful. As soon as we had our bearings, we made straight for the Red Planet, the Mysterious. Flitternix and I took watches alternately and, as we had learned from our former experience how to handle the *'Interstellar,'* the trip became more or less monotonous. We had a little trouble at the start with the switching of the Marconium netting, for it proved rather a puzzle to perience how to handle the *'Interstellar,'* the trip attractions of the Sun, the Earth and the Moon, and at the same time have the planet Mars alone 'pull' us. This bothered us considerably for several days and we made little headway during that period. Finally, when the Moon, Earth and Sun, in the order named, were in a straight line, with Mars almost overhead, our speed rapidly increased and on the evening of the fourth day, the *'Interstellar'* was entirely gravity-insulated from the Moon, Earth and Sun. We were then 'falling' towards Mars at the rate of 20,000 miles an hour. Within 10 days our speed had increased to over 50,000 miles an hour, and the Earth, which from the Moon appeared 14 times as large as the Moon appears to you, had shrunk and shrunk till it looked like a small bright red disc. Mars, in the meanwhile, became rapidly larger and redder and soon it appeared like an ochre disc. At the end of the thirty-fifth day, when our speed had increased to 78,000 miles an hour, due to the proximity of the planet, the Earth had become a bright star in the firmament, somewhat brighter than the other stars, but a pitiful sight compared to what it had appeared when we saw it from the Moon. Remember, the Moon is only 238,000 miles distant from the Earth, while we were now over 50,000,000 miles away. Quite a little difference!

"The next day, the thirty-sixth since our start, we were 200,000 miles distant from Mars, and the planet at this distance was indeed the most gorgeous sight either Flitternix or I had ever witnessed. Mars looked now almost as big to us as the Earth looked when viewed from the Moon. If the Earth was then a wonderful spectacle, the planet Mars, when seen from such a small distance, is simply overwhelming in its splendor. We saw a full red disc, dazzlingly illuminated by the distant Sun's rays. Like the Earth, Mars has a pink fringe running around the edge—its atmosphere. The continents stand forth in an ochre red, intermingled with dark green patches. Faint lines run over the entire face of the planet, like cobwebs—the famous Martian canals. At the top, a brilliant white cap is observed—the north polar ice fields.

"But the most wonderful sight to us was Mars' two little moons. Flitternix calls them toy moons. We had the best view of these moons the next day, when we were some 10,000 miles distant from Mars.

"The planet Mars has two tiny moons, christened Phobos and Deimos by terrestrial astronomers. They were discovered in 1877 by Professor Asaph Hall, of the Washington Observatory, and they were so minute in size that only the most powerful telescopes on Earth reveal them. The largest, Phobos, is about 36 miles in diameter, while the smaller, Deimos, is only 10 miles in diameter. The latter is such a ridiculously small world that a pedestrian could walk around its equator in a single day! An automobile, given a fair road, could circle this entire world in one hour, without exceeding the speed limit!

"PHOBOS, the larger moon, is less than 4,000 miles from the surface of Mars and revolves around the latter in the remarkably short time of 7 hours and 39 minutes. Consequently, the Martians witness the spectacle of their largest moon going through all its phases in 7½ hours! In a single Martian morning, therefore, Phobos can be seen to rapidly change from new moon to first quarter, then full moon, then last quarter and finally again new moon; and all this in 7½ hours! A unique feature about Phobos, too, is that it revolves more quickly around Mars than Mars revolves upon its own axis. Mars turns around its axis in 24 hours, 37 minutes and 22 seconds. Thus the Martian 'day' is almost 38 minutes longer than the terrestrial day. During one Martian day, therefore, Phobos has spun more than three times around Mars! As seen from Mars, Phobos appears about as large as the Moon appears to the inhabitants of the Earth. Deimos, the smaller moon, is 12,300 miles distant from Mars. Whereas its larger brother takes but 7½ hours to revolve around Mars, Deimos requires 132 hours to complete its circuit, or almost six days. However, Deimos is so far removed from Mars, and it is such a tiny object, that to the Martians it really does not appear as a moon at all—at least not as we understand that term. For it must be apparent that if we view an object measuring 10 miles across from a distance of 12,300 miles, we can hardly expect to see much. For that reason, Deimos, when 'full,' appears only slightly larger than the planet Venus appears to you as seen from the Earth. Therefore the Martian nights are not brilliantly illuminated by two large moons, as some writers would have you believe. On the contrary, the Martian night is very much like the terrestrial night, except that Phobos, when full, appears to shed more light on Mars than the Moon sheds on Earth. For the Martian atmosphere is considerably thinner than the terrestrial one, and for that reason it does not absorb so much light.

"After circling around Mars at a height of 10,000 miles for some time, we finally decided to make a landing. By careful maneuvering and switching of our anti-gravitational Marconium netting, we finally descended to a height of but five miles from the surface of Mars. On account of the etherless zone of the Marconium netting when switched on, we could not, of course, see what was beneath us at all times, for light does not pass through etherless space. We had, therefore, only momentary glimpses of the planet during the few seconds when the netting was switched off. This constant switching on and off of the current reduced our speed to almost nothing. We were thus slowly approaching an open plain which we had picked out and which appeared like part of a desert; this was probably sandy enough to effect a soft landing of the *'Interstellar.'* From our momentary glimpses, we had become more than convinced that the planet must indeed be inhabited by intelligent creatures. We had snatched a good view of a wonderfully built city; had seen sections of the mysterious long waterways and their attending strips of vegetation, otherwise known as the Martian canals, and had also observed ponderous aircraft by the thousand and curious structures near the canals that looked like gigantic pyramids.

"Had we still doubted that Mars was inhabited, we were taught differently in a few minutes, for things began to happen rapidly.

"When we were still about two miles from the planet's surface, suddenly, as if by magic, everything before our eyes became yellow. At the same time a peculiar numb sensation came over our bodies and we were hardly able to move hand or foot. Simultaneously, the machinery of the *'Interstellar'* became unmanageable, and, looking through the lower portholes, we could see that we were rapidly coming closer to the planet's surface, at the same time moving in a totally different direction from the one to which we were heading originally.

"With some difficulty, we managed to look up towards the top port windows and we saw a marvelous sight. Three circular, massive structures, which looked like metal aircraft, spaced equal distances apart, were floating in space. The three flyers marked an equilateral triangle while in the exact center, but about one mile lower down than the flyers, our *'Interstellar'* was floating. Three shafts of an intense yellow ray were turned on us and it was this light, or rather the peculiar properties of the rays, which had made us captives to the Martians' superior intelligence.

"We reasoned that these floating forts must be used for defensive purposes on Mars, and we agreed among us that the best thing we could possibly do was to submit ourselves entirely to the Martians' will. Indeed, we were so helpless that we could not have offered any resistance, even had we wanted to do so. Therefore, we calmly awaited developments, for we reasoned instinctively that we would not be harmed. Nor were we mistaken in this view.

"The yellow rays guided the *'Interstellar'* over a vast distance and at the end of an hour we were gently deposited on a huge grassplot in a fairyland 'city.' The instant that our flyer's broad landing belt touched the ground, the yellow rays disappeared and immediately our normal facilities were restored once more. We were free to move and to act.

"We lost no time in unbolting our steel door, and in our anxiety to get out in the open, all three of us, Flitternix, myself and Buster, our Airedale terrier, almost tumbled over each other. I admit that on a historical occasion like this, the first time a human being set foot on another planet, we should have appeared more dignified as, for instance, Christopher Columbus did when he first landed on San Salvador. Sad to relate, however, there was nothing dignified or solemn on the occasion of our landing, and this was partly due to Buster. That infernal dog insisted on running between our feet and succeeded in tripping Flitternix just as he placed his foot on the ground; if it had not been for me, he would have sprawled all over the grass.

"It is a good thing that the Martians have a keen sense of humor, for the crowd that had collected around our flyer began to laugh uproariously in a

queer, characteristic Martian falsetto tone. I admit that we offered a sufficient cause for amusement, the professor in his old Prince Albert and myself attired in my costume of 1797. However, we quickly managed to pull ourselves together and we blinked around us in unconcealed amazement.

"Although the Martian air is very much thinner than the Earth's atmosphere, we experienced but little trouble in breathing, for our stay in the rarefied air of the Moon had taught us how to breathe in thin air. We noticed immediately that the air was very pure and we did not cough once, as was the case of our landing on the Moon. The Martian air seemed rich with ozone, and we could not rid ourselves of the idea at first that we were breathing the strong air of a pine forest.

"But the Martians themselves held us spellbound for some minutes. I am not sure whether they were not as much astonished as we were; for as we found out later, the Martian can conceal his emotions far better than the proverbial Indian. While I was still staring open-mouthed at the nearest Martian, Flitternix, who had recovered first from his surprise, nudged me and said: 'Didn't I tell you?'

"ONLY then did I remember our discourse of the previous day, when we were speculating together as to the probable appearance of the inhabitants of Mars. I remember now that Flitternix had said something like this:

"We have seen on Earth that animal life is possible under the most adverse conditions. We find life at the North Pole in the most awful cold, and we find life at the equator in the most intense heat. We find life in the thinnest mountain air, and we find life at the bottom of the ocean. The latter is particularly interesting, because even up to a few years ago, scientists of note denied that a fairly large creature, such as a fish, could withstand the enormous pressure of water at the bottom of an ocean. For, the scientists argued, the fish would be crushed to death by the thousands of tons of water above it. Not only that, but they argued further that, as it gets colder as one descends into the depths of the ocean, the temperature finally drops below the freezing point of fresh water. How, then, could a fish live in such an abode? It was simply impossible. The fish might just as well live in a frying pan. The arguments were strong indeed against the possibility of life at the bottom of the sea.

"But then the *Challenger* expedition came along and carried on deep-sea dredging. No sooner had this expedition begun to dredge, than they fished from the bottom of the ocean, a most astounding specimen of deep sea fish, built on a plan to withstand enormous pressures. True, it was dead when it arrived at the surface of the ocean, but it was to be expected, for as soon as the enormous pressure to which the fish was accustomed was taken away, he naturally burst inside. So our 'wise' scientists, with their beautiful logic, were wrong once more and the impossible, as always, was found to be very much possible.

"I mention this only in passing, to show you that life can accustom itself to almost any condition. There are very few exceptions, indeed, to this rule, it seems to me. Therefore, we have absolutely no right to believe that the little planet Earth, among the billions of the worlds, should be the only fortunate one on which life thrives. Arrhennius has demonstrated already how life is propagated from one planet to another. This famous philosopher has shown that minute life-carrying spores so small that they cannot be seen by the naked eye, are carried through space, propelled by the pressure of the sunlight till they strike another heavenly body. If the conditions are suitable, the spore will germinate in time and life will spring up—if it is not there already—on that world. It has been proved that these spores can exist in an absolute zero and in a perfect vacuum for years, without losing their germination power—another proof how nature protects life under almost unbelievable conditions. Therefore, to say that there is life only on the Earth, is not only idiotic in the extreme, but it also reveals a total lack of appreciation of the wisdom of Almighty Nature.

"Now, it is also an indisputable fact that plants, animals and humans, too, are entirely dependent upon their surroundings. If, for instance, you take an Eskimo and transplant him and his family on an island under the equator, his light color will change into black in a few generations. Likewise evolution shows that the human body very quickly adapts itself to the tasks imposed upon it. Thus a man whose grandfather and father were hard-working laborers, will nine times out of ten inherit a bony as well as robust body and a relatively small brain. Whereas a man whose grandfather and father were mathematicians, nine times out of ten will have a comparatively small-boned body, which is far from robust, but his brain will be large.

"Surroundings are everything, and given time they will transform man or animal into different beings.

"Now let us apply this reasoning to Mars and let us see what we will find. To begin, it has been proved beyond dispute that Mars has an atmosphere, which, although thinner than that of the Earth, is probably thick enough to sustain human life, even as we know it. Professor Lowell has proved that the mean temperature on Mars is about 47 degrees Fahrenheit. In some sections, near the equator, for instance, the temperature can be less than 65 degrees Fahrenheit. It was argued in former years that, on account of the far greater distance Mars is removed from the Sun than the Earth, the temperature must be far below zero. Recent astronomical researches, however, completely disproved this. As a matter of fact, Mars proper receives really more heat than does the Earth, for the following reasons: The Martian atmosphere is much thinner than the terrestrial, consequently the Sun's rays pierce it with far less loss than is the case on Earth. Then, too, there are no clouds on Mars to cut off almost 50 per cent of the received Sun's rays, as is the actual case on Earth.

"Then again, the Martian day is almost exactly as long as the terrestrial. Also due to the inclination of the Martian axis, which is almost exactly the same as that of the Earth, the seasons are like the terrestrial ones except that they are twice as long, because the Martian year is just twice as long as the terrestrial one.

"Now, we know that the planet Mars, due to its small size, has an older life history than the Earth. Civilization on Mars must date back several hundred thousand years. The law of evolution teaches us that we must therefore expect a very cultured, as well as accomplished race.

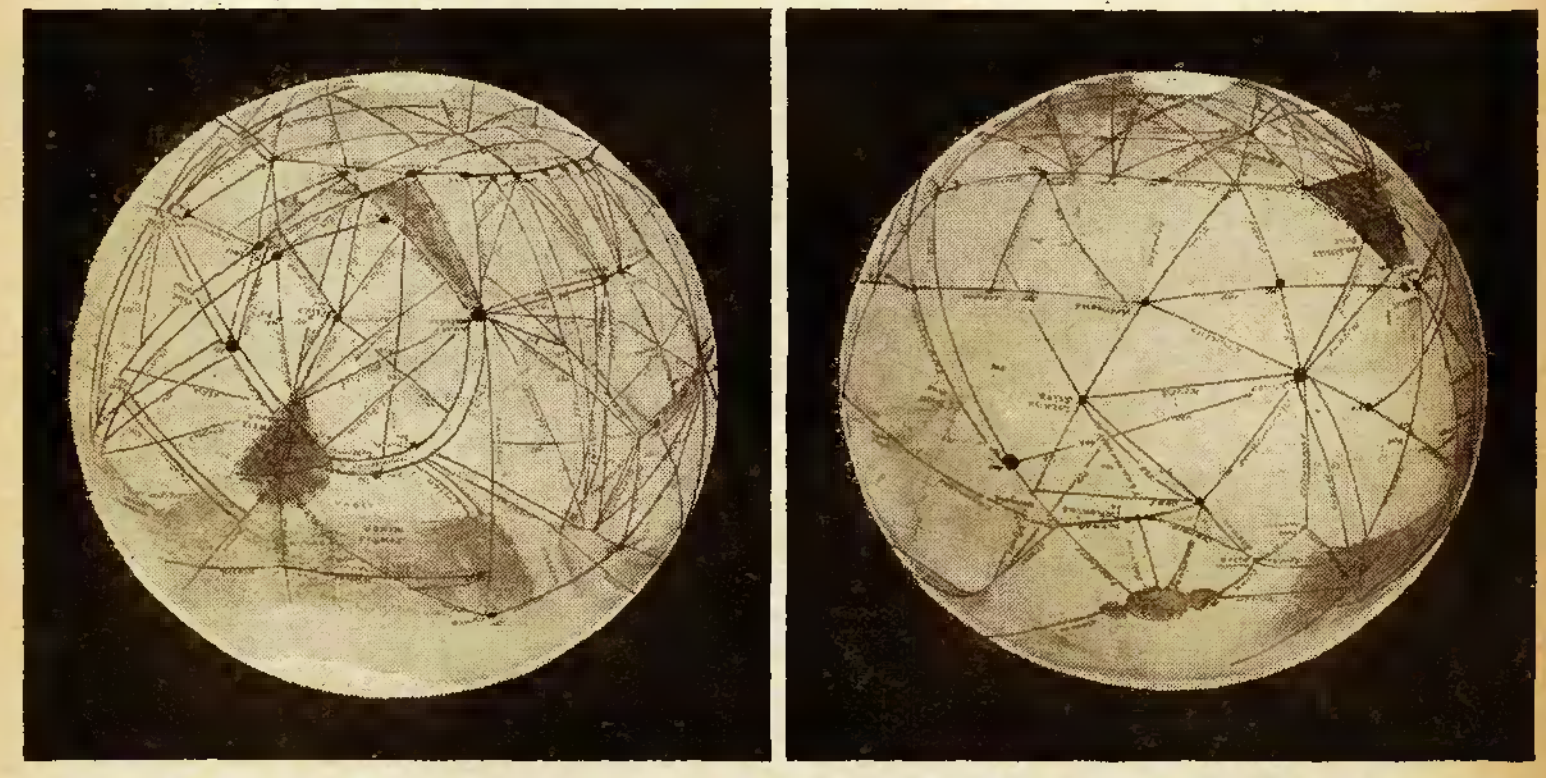
"As our terrestrial evolution shows, the human

head is growing larger and larger all the time. It must have been the same on Mars, for conditions there are almost the same as on Earth. We must, therefore, expect to find a race with enormous heads. As the air is thinner on Mars, sound will not carry as well as in a thicker atmosphere. Therefore, we must expect big funnel-like ears on the Martians, and since a big head almost invariably has big eyes, we may safely deduce that the Martians have large eyes. But there is one important difference of physical conditions on Mars, as compared with those on Earth—namely gravitation. For what weighs one pound on Earth weighs but 0.38 pound, or a little over one-third pound, on Mars. Less bodily weight makes for excessive growth, for the reason that gravity pulls less on the body frame. A little calculation, based upon the above gravitational figures, leads us to suspect that the average Martian should

mals breathe through their noses as a rule.

"As to the Martians' hands, it is probable we will find them rather small in proportion to the rest of the body. The Martians have probably advanced so far that manual labor has been abolished for hundreds of generations. It is almost certain that as everything must be done with machinery, manual labor is absolutely unknown today on Mars. This naturally, in the course of several thousand years, begins to tell and the hands must shrink. We may therefore expect that the eight-foot Martian has a hand rather smaller than ours. Again, as no physical labor of any sort is performed by the Martian, his arms are probably thin and muscleless.

"As to his feet, we shall, in all probability, find them to be very large. They must support a tall and rather heavy body, and they must, therefore, provide sufficient area to enable the Martian to walk prop-



Our friend, the Baron, is quite impressed by the canals of Mars, and it would seem to be no wonder, when we examine the illustrations above, which we have just received from the Lowell Observatory at Flaggstaff, Arizona, giving us the latest telescopic views of the planet. It will be seen that the canals, in many cases practically straight, or are almost on the great circles of the planet, suggesting very strongly artificial construction, while some of them which are curved, are so regularly placed as to emphasize the idea that they were constructed by intelligent beings.

be about eight feet tall. As the sunlight is very much stronger on account of the thin air on Mars, the Martian, unless he is in the shade most of the time, probably has a dark skin, which may be as red as that of a North American Indian or as dark as that of a West Indian.

"As the air is so thin on Mars and as oxygen is needed in large quantities for such big bodies as the Martians, we will not be surprised to find that the Martian has an immense torso, to accommodate his ponderous lungs. The latter must be doubly large in order to sustain such a large body and also to work over quickly the small volume of oxygen in the thin air. But large lungs also invariably require a large nose, as we know from experience on earth. Consequently, if the Martians have a ponderous nose, don't be surprised, for evolution shows us that anierly. Also, the feet must be large on account of Mars' small gravitational attraction, for if the Martian's feet were small, he could not secure the proper foothold to propel his body; he would be hopping, instead of walking.

"Therefore, when we behold the first Martian, we will probably find him totally different in looks from a human being, and while my reasoning as to his probable appearance may be inaccurate in spots, I am sure that on the whole I will be correct.".

"SO spoke Flitternix.

"He was right, marvelously right. His scientific prophecy, obtained by logic, reminded me of Leverrier, the French astronomer, who, by cold reasoning and mathematics, on August 31, 1846, pre-

(*Continued on page* 84)

The MIRACLE OF THE LILY

by Clare Winger Harris

Author of "The Fate of the Poseidonia"

The figure that stood facing us was a huge six-legged beetle . . . an insect of gigantic proportions. . . . Suddenly, the Venusian was joined by another being, a colossal ant, who bore in his forelegs a tiny light-colored object, which he handed to the beetle-announcer, who took it and held it forward for our closer inspection. It seemed to be a tiny ape, but was so small, we could not ascertain for a certainty.

CHAPTER I

The Passing of a Kingdom

SINCE the comparatively recent resumé of the ancient order of agriculture I, Nathano, have been asked to set down the extraordinary events of the past two thousand years, at the beginning of which time the supremacy of man, chief of the mammals, threatened to come to an untimely end.

Ever since the dawn of life upon this globe, life, which it seemed had crept from the slime of the sea, only two great types had been the rulers; the reptiles and the mammals. The former held undisputed sway for eons, but gave way eventually before the smaller, but intellectually superior mammals. Man himself, the supreme example of the ability of life to govern and control inanimate matter, was master of the world with apparently none to dispute his right. Yet, so blinded was he with pride over the continued exercise of his power on Earth over other lower types of mammals and the nearly extinct reptiles, that he failed to notice the slow but steady rise of another branch of life, different from his own; smaller, it is true, but no smaller than he had been in comparison with the mighty reptilian monsters that roamed the swamps in Mesozoic times.

These new enemies of man, though seldom attacking him personally, threatened his downfall by destroying his chief means of sustenance, so that by the close of the twentieth century, strange and daring projects were laid before the various governments of the world with an idea of fighting man's insect enemies to the finish. These pests were growing in size, multiplying so rapidly and destroying so much vegetation, that eventually no plants would be left to sustain human life. Humanity suddenly woke to the realization that it might suffer the fate of the nearly extinct reptiles. Would mankind be able to prevent the encroachment of the insects? And at last man *knew* that unless drastic measures were taken *at once,* a third great class of life was on the brink of terrestrial sovereignty.

Of course no great changes in development come suddenly. Slow evolutionary progress had brought us up to the point, where, with the application of outside pressure, we were ready to handle a situation, that, a century before, would have overwhelmed us.

I reproduce here in part a lecture delivered by a great American scientist, a talk which, sent by radio throughout the world, changed the destiny of mankind: but whether for good or for evil I will leave you to judge at the conclusion of this story.

"Only in comparatively recent times has man succeeded in conquering natural enemies; flood, storm, inclemency of climate, distance, and now we face an encroaching menace to the whole of humanity. Have we learned more and more of truth and of the laws that control matter only to succumb to the first real danger that threatens us with extermination? Surely, no matter what the cost, you will rally to the solution of our problem, and I believe, friends, that I have discovered the answer to the enigma.

"I know that many of you, like my friend Professor Fair, will believe my ideas too extreme, but I am convinced that unless you are willing to put behind you those notions which are old and not utilitarian, you cannot hope to cope with the present situation.

"Already, in the past few decades, you have realized the utter futility of encumbering yourselves with superfluous possessions that had no useful virtue, but which, for various sentimental reasons, you continued to hoard, thus lessening the degree of your life's efficiency by using for it time and attention that should have been applied to the practical work of life's accomplishments. You have given these things up slowly, but I am now going to ask you to relinquish the rest of them *quickly;* everything that interferes in any way with the immediate disposal of our enemies, the insects."

At this point, it seems that my worthy ancestor, Professor Fair, objected to the scientist's words, asserting that efficiency at the expense of some of the sentimental virtues was undesirable and not conducive to happiness, the real goal of man. The scientist, in his turn, argued that happiness was available only through a perfect adaptability to one's environment, and that efficiency *sans* love, mercy and the softer sentiments was the short cut to human bliss.

It took a number of years for the scientist to put over his scheme of salvation, but in the end he succeeded, not so much from the persuasiveness of his words, as because prompt action of some sort was necessary. There was not enough food to feed the people of the earth. Fruit and vegetables were becoming a thing of the past. Too much protein food in the form of meat and fish was injuring the race, and at last the people realized that, for fruits and vegetables, or their nutritive equivalent, they must turn from the field to the laboratory; from the farmer to the chemist. Synthetic food was the solution to the problem. There was no longer any use in planting and caring for food stuffs destined to become the nourishment of man's most deadly enemy.

The last planting took place in 2900, but there was no harvest, the voracious insects took every green shoot as soon as it appeared, and even trees, that had previously withstood the attacks of the huge insects, were by this time, stripped of every vestige of greenery.

The vegetable world suddenly ceased to exist. Over the barren plains which had been gradually filling with vast cities, man-made fires brought devastation to every living bit of greenery, so that in all the world there was no food for the insect pests.

OUR readers will remember the author of this story as the third prize winner in our $500.00 prize contest last year. Here again Mrs. Harris shows her versatility by delving into the future and striking a novel chord. Insects were, and still are, man's greatest enemies, and will remain so for many years to come. There is no telling that insects might not come into ascendancy once more at any time. The picture which the author draws here, therefore, is certainly not too far fetched or impossible; perhaps it is not even improbable.

CHAPTER II

Man or Insect?

Extract from the diary of Delfair, a descendant of Professor Fair, who had opposed the daring scientist.

FROM the borders of the great state-city of Iowa, I was witness to the passing of one of the great kingdoms of earth—the vegetable, and I can not find words to express the grief that overwhelms me as I write of its demise, for I loved all growing things. Many of us realized that Earth was no longer beautiful; but if beauty meant death; better life in the sterility of the metropolis.

The viciousness of the thwarted insects was a menace that we had foreseen and yet failed to take into adequate account. On the city-state borderland, life is constantly imperiled by the attacks of well organized bodies of our dreaded foe.

(*Note*: The organization that now exists among the ants, bees and other insects, testifies to the possibility of the development of military tactics among them in the centuries to come.)

Robbed of their source of food, they have become emboldened to such an extent that they will take any risks to carry human beings away for food, and after one of their well organized raids, the toll of human life is appalling.

But the great chemical laboratories where our synthetic food is made, and our oxygen plants, we thought were impregnable to their attacks. In that we were mistaken.

Let me say briefly that since the destruction of all vegetation which furnished a part of the oxygen essential to human life, it became necessary to manufacture this gas artificially for general diffusion through the atmosphere.

I was flying to my work, which is in Oxygen Plant No. 21, when I noticed a peculiar thing on the upper speedway near Food Plant No. 3,439. Although it was night, the various levels of the state-city were illuminated as brightly as by day. A pleasure vehicle was going with prodigious speed westward. I looked after it in amazement. It was unquestionably the car of Eric, my co-worker at Oxygen Plant No. 21. I recognized the gay color of its body, but to verify my suspicions beyond the question of a doubt, I turned my volplane in pursuit and made out the familiar license number. What was Eric doing away from the plant before I had arrived to relieve him from duty?

In hot pursuit, I sped above the car to the very border of the state-city, wondering what unheard of errand took him to the land of the enemy, for the car came to a sudden stop at the edge of what had once been an agricultural area. Miles ahead of me stretched an enormous expanse of black sterility; at my back was the teeming metropolis, five levels high—if one counted the hangar-level, which did not cover the residence sections.

I had not long to wait, for almost immediately my friend appeared. What a sight he presented to my incredulous gaze! He was literally covered from head to foot with the two-inch ants, that next to the beetles, had proved the greatest menace in their attacks upon humanity. With wild incoherent cries he fled over the rock and stubble-burned earth.

As soon as my stunned senses permitted, I swooped down toward him to effect a rescue, but even as my plane touched the barren earth, I saw that I was too late, for he fell, borne down by the vicious attacks of his myriad foes. I knew it was useless for me to set foot upon the ground, for my fate would be that of Eric. I rose ten feet and seizing my poison-gas weapon, let its contents out upon the tiny black evil things that swarmed below. I did not bother with my mask, for I planned to rise immediately, and it was not a moment too soon. From across the waste-land, a dark cloud eclipsed the stars and I saw coming toward me a horde of flying ants interspersed with larger flying insects, all bent upon my annihilation. I now took my mask and prepared to turn more gas upon my pursuers, but alas, I had used every atom of it in my attack upon the non-flying ants! I had no recourse but flight, and to this I immediately resorted, knowing that I could outdistance my pursuers.

When I could no longer see them, I removed my gas mask. A suffocating sensation seized me. I could not breathe! How high had I flown in my endeavor to escape the flying ants? I leaned over the side of my plane, expecting to see the city far, far below me. What was my utter amazement when I discovered that I was scarcely a thousand feet high! It was not altitude that was depriving me of the life-giving oxygen.

A drop of three hundred feet showed me inert specks of humanity lying about the streets. Then I knew; *the oxygen plant was not in operation!* In another minute I had on my oxygen mask, which was attached to a small portable tank for emergency use, and I rushed for the vicinity of the plant. There I witnessed the first signs of life. Men equipped with oxygen masks, were trying to force entrance into the locked building. Being an employee, I possessed knowledge of the combination of the great lock, and I opened the door, only to be greeted by a swarm of ants that commenced a concerted attack upon us.

The floor seemed to be covered with a moving black rug, the corner nearest the door appearing to unravel as we entered, and it was but a few seconds before we were covered with the clinging, biting creatures, who fought with a supernatural energy born of despair. Two very active ants succeeded in getting under my helmet. The bite of their sharp mandibles and the effect of their poisonous formic acid became intolerable. Did I dare remove my mask while the air about me was foul with the gas discharged from the weapons of my allies? While I felt the attacks elsewhere upon my body gradually diminishing as the insects succumbed to the deadly fumes, the two upon my face waxed more vicious under the protection of my mask. One at each eye, they were trying to blind me. The pain was unbearable. Better the suffocating death-gas than the torture of lacerated eyes! Frantically I removed the head-gear and tore at the shiny black fiends. Strange to tell, I discovered that I could breathe near the vicinity of the great oxygen tanks, where enough oxygen lingered to support life at least temporarily. The two vicious insects, no longer protected by my gas-mask, scurried from me like rats from a sinking ship and disappeared behind the oxygen tanks.

This attack of our enemies, though unsuccessful on their part, was dire in its significance, for it had shown more cunning and ingenuity than anything that had ever preceded it. Heretofore, their onslaughts had been confined to direct attacks upon us personally or upon the synthetic-food laboratories, but in this last raid they had shown an amazing cleverness that portended future disaster, unless they were checked at once. It was obvious they had ingeniously planned to smother us by the suspension

of work at the oxygen plant, knowing that they themselves could exist in an atmosphere containing a greater percentage of carbon-dioxide. Their scheme, then, was to raid our laboratories for food.

CHAPTER III

Lucanus the Last

A Continuation of Delfair's Account

ALTHOUGH it was evident that the cessation of all plant-life spelled inevitable doom for the insect inhabitants of Earth, their extermination did not follow as rapidly as one might have supposed. There were years of internecine warfare. The insects continued to thrive, though in decreasing numbers, upon stolen laboratory foods, bodies of human-beings and finally upon each other; at first capturing enemy species and at last even resorting to a cannibalistic procedure. Their rapacity grew in inverse proportion to their waning numbers, until the meeting of even an isolated insect might mean death, unless one were equipped with poison gas and prepared to use it upon a second's notice.

I am an old man now, though I have not yet lived quite two centuries, but I am happy in the knowledge that I have lived to see the last living insect which was held in captivity. It was an excellent specimen of the stag-beetle (*Lucanus*) and the years have testified that it was the sole survivor of a form of life that might have succeeded man upon this planet. This beetle was caught weeks after we had previously seen what was supposed to be the last living thing upon the globe, barring man and the sea-life. Untiring search for years has failed to reveal any more insects, so that at last man rests secure in the knowledge that he is monarch of all he surveys.

I have heard that long, long ago man used to gaze with a fearful fascination upon the reptilian creatures which he displaced, and just so did he view this lone specimen of a type of life that might have covered the face of the earth, but for man's ingenuity.

It was this unholy lure that drew me one day to view the captive beetle in his cage in district 404 at Universapolis. I was amazed at the size of the creature, for it looked larger than when I had seen it by television, but I reasoned that upon that occasion there had been no object near with which to compare its size. True, the broadcaster had announced its dimensions, but the statistics concretely given had failed to register a perfect realization of its prodigious proportions.

As I approached the cage, the creature was lying with its dorsal covering toward me and I judged it measured fourteen inches from one extremity to the other. Its smooth horny sheath gleamed in the bright artificial light. (It was confined on the third level.) As I stood there, mentally conjuring a picture of a world overrun with billions of such creatures as the one before me, the keeper approached the cage with a meal-portion of synthetic food. Although the food has no odor, the beetle sensed the man's approach, for it rose on its jointed legs and came toward us, its horn-like prongs moving threateningly; then apparently remembering its confinement, and the impotency of an attack, it subsided and quickly ate the food which had been placed within its prison.

The food consumed, it lifted itself to its hind legs, partially supported by a box, and turned its great eyes upon me. I had never been regarded with such utter malevolence before. The detestation was almost tangible and I shuddered involuntarily. As plainly as if he spoke, I knew that Lucanus was perfectly cognizant of the situation and in his gaze I read the concentrated hate of an entire defeated race.

I had no desire to gloat over his misfortune, rather a great pity toward him welled up within me. I pictured myself alone, the last of my kind, held up for ridicule before the swarming hordes of insects who had conquered my people, and I knew that life would no longer be worth the living.

Whether he sensed my pity or not I do not know, but he continued to survey me with unmitigated rage, as if he would convey to me the information that his was an impacable hatred that would outlast eternity.

Not long after this he died, and a world long since intolerant of ceremony, surprised itself by interring the beetle's remains in a golden casket, accompanied by much pomp and splendor.

I have lived many long years since that memorable event, and undoubtedly my days here are numbered, but I can pass on happily, convinced that in this sphere man's conquest of his environment is supreme.

CHAPTER IV

Efficiency Maximum

In a direct line of descent from Professor Fair and Delfair, the author of the preceding chapter, comes Thanor whose journal is given in this chapter.

AM I a true product of the year 2928? Sometimes I am convinced that I am hopelessly old-fashioned, an anachronism, that should have existed a thousand years ago. In no other way can I account for the dissatisfaction I feel in a world where efficiency has at last reached a maximum.

I am told that I spring from a line of ancestors who were not readily acclimated to changing conditions. I love beauty, yet I see none of it here. There are many who think our lofty buildings that tower two and three thousand feet into the air are beautiful, but while they are architectural splendors, they do not represent the kind of loveliness I crave. Only when I visit the sea do I feel any satisfaction for a certain yearning in my soul. The ocean alone shows the handiwork of God. The land bears evidence only of man.

As I read back through the diaries of my sentimental ancestors I find occasional glowing descriptions of the world that was; the world before the insects menaced human existence. Trees, plants and flowers brought delight into the lives of people as they wandered among them in vast open spaces, I am told, where the earth was soft beneath the feet, and flying creatures, called birds, sang among the greenery. True, I learn that many people had not enough to eat, and that uncontrollable passions governed them, but I do believe it must have been more interesting than this methodical, unemotional existence. I can not understand why many people were poor, for I am told that Nature as manifested in

the vegetable kingdom was very prolific; so much so that year after year quantities of food rotted on the ground. The fault, I find by my reading, was not with Nature but with man's economic system which is now perfect, though this perfection really brings few of us happiness, I think.

Now there is no waste; all is converted into food. Long ago man learned how to reduce all matter to its constituent elements, of which there are nearly a hundred in number, and from them to rebuild compounds for food. The old axiom that nothing is created or destroyed, but merely changed from one form to another, has stood the test of ages. Man, as the agent of God, has simply performed the miracle of transmutation himself instead of waiting for natural forces to accomplish it as in the old days.

At first humanity was horrified when it was decreed that it must relinquish its dead to the laboratory. For too many eons had man closely associated the soul and body, failing to comprehend the body as merely a material agent, through which the spirit functioned. When man knew at last of the eternal qualities of spirit, he ceased to regard the discarded body with reverential awe, and saw in it only the same molecular constituents which comprised all matter about him. He recognized only material basically the same as that of stone or metal; material to be reduced to its atomic elements and rebuilt into matter that would render service to living humanity; that portion of matter wherein spirit functions.

The drab monotony of life is appalling. Is it possible that man had reached his height a thousand years ago and should have been willing to resign Earth's sovereignty to a coming order of creatures destined to be man's worthy successor in the eons to come? It seems that life is interesting only when there is a struggle, a goal to be reached through an evolutionary process. Once the goal is attained, all progress ceases. The huge reptiles of preglacial ages rose to supremacy by virtue of their great size, and yet was it not the excessive bulk of those creatures that finally wiped them out of existence? Nature, it seems, avoids extremes. She allows the fantastic to develop for awhile and then wipes the slate clean for a new order of development. Is it not conceivable that man could destroy himself through excessive development of his nervous system, and give place for the future evolution of a comparatively simple form of life, such as the insects were at man's height of development? This, it seems to me, was the great plan; a scheme with which man dared to interfere and for which he is now paying by the boredom of existence.

The earth's population is decreasing so rapidly, that I fear another thousand years will see a lifeless planet hurtling through space. It seems to me that only a miracle will save us now.

CHAPTER V

The Year 3928

The Original Writer, Nathano, Resumes the Narrative

MY ancestor, Thanor, of ten centuries ago, according to the records he gave to my great grandfather, seems to voice the general despair of humanity which, bad enough in his times, has reached the *nth* power in my day. A soulless world is gradually dying from self-inflicted boredom.

As I have ascertained from the perusal of the journals of my forebears, even antedating the extermination of the insects, I come of a stock that clings with sentimental tenacity to the things that made life worth while in the old days. If the world at large knew of my emotional musings concerning past ages, it would scarcely tolerate me, but surrounded by my thought-insulator, I often indulge in what fancies I will, and such meditation, coupled with a love for a few ancient relics from the past, have led me to a most amazing discovery.

Several months ago I found among my family relics a golden receptacle two feet long, one and a half in width and one in depth, which I found, upon opening, to contain many tiny square compartments, each filled with minute objects of slightly varying size, texture and color.

"Not sand!" I exclaimed as I closely examined the little particles of matter.

Food? After eating some, I was convinced that their nutritive value was small in comparison with a similar quantity of the products of our laboratories. What were the mysterious objects?

Just as I was about to close the lid again, convinced that I had one over-sentimental ancestor, whose gift to posterity was absolutely useless, my pocket-radio buzzed and the voice of my friend, Stentor, the interplanetary broadcaster, issued from the tiny instrument.

"If you're going to be home this afternoon," said Stentor, "I'll skate over. I have some interesting news."

I consented, for I thought I would share my "find" with this friend whom I loved above all others, but before he arrived I had again hidden my golden chest, for I had decided to await the development of events before sharing its mysterious secret with another. It was well that I did this for Stentor was so filled with the importance of his own news that he could have given me little attention at first.

"Well, what is your interesting news?" I asked after he was comfortably seated in my adjustable chair.

"You'd never guess," he replied with irritating leisureliness.

"Does it pertain to Mars or Venus?" I queried. "What news of our neighbor planets?"

"You may know it has nothing to do with the self-satisfied Martians," answered the broadcaster, "but the Venusians have a very serious problem confronting them. It is in connection with the same old difficulty they have had ever since interplanetary radio was developed forty years ago. You remember, that, in their second communication with us, they told us of their continual warfare on insect pests that were destroying all vegetable food? Well, last night after general broadcasting had ceased, I was surprised to hear the voice of the Venusian broadcaster. He is suggesting that we get up a scientific expedition to Venus to help the natives of his unfortunate planet solve their insect problem as we did ours. He says the Martians turn a deaf ear to their plea for help, but he expects sympathy and assistance from Earth who has so recently solved these problems for herself."

I was dumbfounded at Stentor's news.

"But the Venusians are farther advanced mechanically than we," I objected, "though they are behind us in the natural sciences. They could much more easily solve the difficulties of space-flying than we could."

"That is true," agreed Stentor, "but if we are to render them material aid in freeing their world from devastating insects, we must get to Venus. The past four decades have proved that we can not help them merely by verbal instructions."

"Now, last night," Stentor continued, with warming enthusiasm, "Wanyana, the Venusian broadcaster, informed me that scientists on Venus are developing interplanetary television. This, if successful, will prove highly beneficial in facilitating communication, and it may even do away with the necessity of interplanetary travel, which I think is centuries ahead of us yet."

"Television, though so common here on Earth and on Venus, has seemed an impossibility across the ethereal void," I said, "but if it becomes a reality, I believe it will be the Venusians who will take the initiative, though of course they will be helpless without our friendly cooperation. In return for the mechanical instructions they have given us from time to time, I think it no more than right that we should try to give them all the help possible in freeing their world, as ours has been freed, of the insects that threaten their very existence. Personally, therefore, I hope it can be done through radio and television rather than by personal excursions."

"I believe you are right," he admitted, "but I hope we can be of service to them soon. Ever since I have served in the capacity of official interplanetary broadcaster, I have liked the spirit of goodfellowship shown by the Venusians through their spokesman, Wanyana. The impression is favorable in contrast to the superciliousness of the inhabitants of Mars."

We conversed for some time, but at length he rose to take his leave. It was then I ventured to broach the subject that was uppermost in my thoughts.

"I want to show you something, Stentor," I said, going into an adjoining room for my precious box and returning shortly with it. "A relic from the days of an ancestor named Delfair, who lived at the time the last insect, a beetle, was kept in captivity. Judging from his personal account, Delfair was fully aware of the significance of the changing times in which he lived, and contrary to the majority of his contemporaries, possessed a sentimentality of soul that has proved an historical asset to future generations. Look, my friend, these he left to posterity!"

I deposited the heavy casket on a table between us and lifted the lid, revealing to Stentor the mystifying particles.

The face of Stentor was eloquent of astonishment. Not unnaturally his mind took somewhat the same route as mine had followed previously, though he added atomic-power-units to the list of possibilities. He shook his head in perplexity.

"Whatever they are, there must have been a real purpose behind their preservation," he said at last. "You say this old Delfair witnessed the passing of the insects? What sort of a fellow was he? Likely to be up to any tricks?"

"Not at all," I asserted rather indignantly, "he seemed a very serious minded chap; worked in an oxygen-plant and took an active part in the last warfare between men and insects."

Suddenly Stentor stooped over and scooped up some of the minute particles into the palm of his hand—and then he uttered a maniacal shriek and flung them into the air.

"Great God, man, do you know what they are?" he screamed, shaking violently.

"No, I do not," I replied quietly, with an attempt at dignity I did not feel.

"Insect eggs!" he cried, and shuddering with terror, he made for the door.

I caught him on the threshold and pulled him forcibly back into the room.

"Now see here," I said sternly, "not a word of this to anyone. Do you understand? I will test out your theory in every possible way but I want no public interference."

At first he was obstinate, but finally yielded to threats when supplications were impotent.

"I will test them," I said, "and will endeavor to keep hatchings under absolute control, should they prove to be what you suspect."

It was time for the evening broadcasting, so he left, promising to keep our secret and leaving me regretting that I had taken another into my confidence.

CHAPTER VI

The Miracle

FOR days following my unfortunate experience with Stentor, I experimented upon the tiny objects that had so terrified him. I subjected them to various tests for the purpose of ascertaining whether or not they bore evidence of life, whether in egg, pupa or larva stages of development. And to all my experiments, there was but one answer. No life was manifest. Yet I was not satisfied, for chemical tests showed that they were composed of organic matter. Here was an inexplicable enigma! Many times I was on the verge of consigning the entire contents of the chest to the flames. I seemed to see in my mind's eye the world again over-ridden with insects, and that calamity due to the indiscretions of one man! My next impulse was to turn over my problem to scientists, when a suspicion of the truth dawned upon me. These were seeds, the germs of plant-life, and they might grow. But alas, where? Over all the earth man has spread his artificial dominion. The state-city has been succeeded by what could be termed the nation-city, for one great floor of concrete or rock covers the country.

I resolved to try an experiment, the far-reaching influence of which I did not at that time suspect. Beneath the lowest level of the community edifice in which I dwell, I removed, by means of a small atomic excavator, a slab of concrete large enough to admit my body. I let myself down into the hole and felt my feet resting on a soft dark substance that I knew to be dirt. I hastily filled a box of this, and after replacing the concrete slab, returned to my room, where I proceeded to plant a variety of the seeds.

Being a product of an age when practically to wish for a thing in a material sense is to have it, I experienced the greatest impatience, while waiting for any evidences of plant-life to become manifest.

Daily, yes hourly, I watched the soil for signs of a type of life long since departed from the earth, and was about convinced that the germ of life could not have survived the centuries, when a tiny blade of green proved to me that a miracle, more wonderful to me than the works of man through the ages, was taking place before my eyes. This was an enigma so complex and yet so simple, that one recognized in it a direct revelation of Nature.

Daily and weekly I watched in secret the botanical miracle. It was my one obsession. I was amazed at the fascination it held for me—a man who viewed the marvels of the thirty-fourth century with unemotional complacency. It showed me that Nature is manifest in the simple things which mankind has chosen to ignore.

Then one morning, when I awoke, a white blossom displayed its immaculate beauty and sent forth its delicate fragrance into the air. The lily, a symbol of new life, resurrection! I felt within me the stirring of strange emotions I had long believed dead in the bosom of man. But the message must not be for me alone. As of old, the lily would be the symbol of life for all!

With trembling hands, I carried my precious burden to a front window where it might be witnessed by all who passed by. The first day there were few who saw it, for only rarely do men and women walk; they usually ride in speeding vehicles of one kind or another, or employ electric skates, a delightful means of locomotion, which gives the body some exercise. The fourth city level, which is reserved for skaters and pedestrians, is kept in a smooth glass-like condition. And so it was only the occasional pedestrian, walking on the outer border of the fourth level, upon which my window faced, who first carried the news of the growing plant to the world, and it was not long before it was necessary for civic authorities to disperse the crowds that thronged to my window for a glimpse of a miracle in green and white.

When I showed my beautiful plant to Stentor, he was most profuse in his apology and came to my rooms every day to watch it unfold and develop, but the majority of people, long used to business-like efficiency, were intolerant of the sentimental emotions that swayed a small minority, and I was commanded to dispose of the lily. But a figurative seed had been planted in the human heart, a seed that could not be disposed of so readily, and this seed ripened and grew until it finally bore fruit.

CHAPTER VII

Ex Terreno

IT is a very different picture of humanity that I paint ten years after the last entry in my diary. My new vocation is farming, but it is farming on a far more intensive scale than had been done two thousand years ago. Our crops never fail, for temperature and rainfall are regulated artificially. But we attribute our success principally to the total absence of insect pests. Our small agricultural areas dot the country like the parks of ancient days and supply us with a type of food, no more nourishing, but more appetizing than that produced in the laboratories. Truly we are living in a marvelous age! If the earth is ours completely, why may we not turn our thoughts toward the other planets in our solar-system? For the past ten or eleven years the Venusians have repeatedly urged us to come and assist them in their battle for life. I believe it is our duty to help them.

Tomorrow will be a great day for us and especially for Stentor, as the new interplanetary television is to be tested, and it is possible that for the first time in history, we shall see our neighbors in the infinity of space. Although the people of Venus were about a thousand years behind us in many respects, they have made wonderful progress with radio and television. We have been in radio communication with them for the last half century and they shared with us the joy of the establishment of our Eden. They have always been greatly interested in hearing Stentor tell the story of our subjugation of the insects that threatened to wipe us out of existence, for they have exactly that problem to solve now; judging from their reports, we fear that theirs is a losing battle. To-morrow we shall converse face to face with the Venusians! It will be an event second in importance only to the first radio communications interchanged fifty years ago. Stentor's excitement exceeds that displayed at the time of the discovery of the seeds.

Well it is over and the experiment was a success, but alas for the revelation!

The great assembly halls all over the continent were packed with humanity eager to catch a first glimpse of the Venusians. Prior to the test, we sent our message of friendship and good will by radio, and received a reciprocal one from our interplanetary neighbors. Alas, we were ignorant at that time! Then the television receiving apparatus was put into operation, and we sat with breathless interest, our eyes intent upon the crystal screen before us. I sat near Stentor and noted the feverish ardor with which he watched for the first glimpse of Wanyana.

At first hazy mist-like spectres seemed to glide across the screen. We knew these figures were not in correct perspective. Finally, one object gradually became more opaque, its outlines could be seen clearly. Then across that vast assemblage, as well as thousands of others throughout the world, there swept a wave of speechless horror, as its full significance burst upon mankind.

The figure that stood facing us was a huge six-legged beetle, not identical in every detail with our earthly enemies of past years, but unmistakably an insect of gigantic proportions! Of course it could not see us, for our broadcaster was not to appear until afterward, but it spoke, and we had to close our eyes to convince ourselves that it was the familiar voice of Wanyana, the leading Venusian radio broadcaster. Stentor grabbed my arm, uttered an inarticulate cry and would have fallen but for my timely support.

"Friends of Earth, as you call your world," began the object of horror, "this is a momentous occasion in the annals of the twin planets, and we are looking forward to seeing one of you, and preferably Stentor, for the first time, as you are now viewing one of us. We have listened many times, with interest, to your story of the insect pests which threatened to follow you as lords of your planet. As you have often heard us tell, we are likewise molested with insects. Our fight is a losing one, unless we can soon exterminate them."

Suddenly, the Venusian was joined by another being, a colossal ant, who bore in his fore-legs a tiny light-colored object which he handed to the beetle-announcer, who took it and held it forward for our closer inspection. It seemed to be a tiny ape, but was so small we could not ascertain for a certainty. We were convinced, however, that it was a mammalian creature, an "insect" pest of Venus. Yet in it we recognized rudimentary man as we know him on earth!

There was no question as to the direction in which sympathies instinctively turned, yet reason told us that our pity should be given to the intelligent reigning race who had risen to its present mental attainment through eons of time. By some quirk or freak of nature, way back in the beginning, life had developed in the form of insects instead of mammals. Or (the thought was repellent) had insects in the past succeeded in displacing mammals, as they might have done here on earth?

There was no more television that night. Stentor would not appear, so disturbed was he by the sight of the Venusians, but in the morning, he talked to them by radio and explained the very natural antipathy we experienced in seeing them or in having them see us.

Now they no longer urge us to construct ethers-hips and go to help them dispose of their "insects." I think they are afraid of us, and their very fear has aroused in mankind an unholy desire to conquer them.

I am against it. Have we not had enough of war in the past? We have subdued our own world and should be content with that, instead of seeking new worlds to conquer. But life is too easy here. I can plainly see that. Much as he may seem to dislike it, man is not happy, unless he has some enemy to overcome, some difficulty to surmount.

Alas my greatest fears for man were groundless!

A short time ago, when I went out into my field to see how my crops were faring, I found a six-pronged beetle voraciously eating. No—man will not need to go to Venus to fight "insects."

THE END

WHEN HEARTS REMEMBER HOME

Eternity is calling
  Above the zigzag trail
That climbs the furrowed mountain wall,
  High over brook and dale.
My child, if you are weary;
  My life, if you are sad,
Look far, far up to cloudless blue
  And let your heart be glad.

When darkness fills the valley,
  And slopes and peaks are dim,
Infinity comes whispering
  Above the mountain rim.
My child, if you are tired
  Of earth, of toil or play,
Glance up and see the Universe,
  Aglow with endless day.

—Leland S. Copeland.

The ANCIENT HORROR

by Hal Grant

His hand had barely grasped the oar again when, silently, from the blue depths, there came into view, just behind Wilson, the awful head and neck of the creature we had dimly seen that night, when we sat crouched on a shaky platform . . . Up it rose, to a height of seven or eight feet, while I, gazing upon its utter frightfulness, stood paralyzed and dumb. I saw its cavernous mouth, fully three feet from the snout to the angle of the jaw; saw it open and reveal its gleaming, needle-sharp teeth over the head of the unfortunate man.

IT will be interesting if they happen to find the lizard and it turns out to be the real thing."

"What thing?" I asked. Rutherford had been reading the paper to himself.

By way of reply, he handed me the paper, at the same time pointing to a head-line carrying the information that scientists were on their way to Africa to search for a "PRE-HISTORIC MONSTER SEEN BY HUNTERS IN NORTHERN AFRICAN SWAMP."

From the writer's description, I gathered the idea that the creature was supposed to belong to one of the species of gigantic saurians that roamed the earth during the reptilian age, some five hundred millions of years ago.

I thought the story a hoax and said so. Rutherford didn't agree with me, calling my attention to the fact that the men—whose names were given—were all well known, which made it unlikely that any writer would use them in connection with anything that savoured of deceit.

"I believe they have evidence warranting such an expedition, or they would not go. Moreover, I shall not be surprised to read, at some future date, that they have discovered the thing, whatever it is, and that it furnishes them with some very interesting experiences."

Well, every one has a right to his opinion, even though he has no foundation upon which to base it, so I didn't argue with him, beyond saying that I presumed he had some very good reason for being so positive.

Perhaps he thought I was a trifle sarcastic. At any rate he looked at me through contracted eyes for a moment, as if trying to make up his mind about something; then, having filled his pipe, he reached for a match and, after lighting the tobacco, he said quietly, "Yes, I do believe there are living descendants of those saurians and that they are, in appearance, like the old fellows we read about. Also, I believe I have good reason for thinking there are some that resemble no known species, and, since you won't take any stock in my belief until you have some proof, I am going to give you some, provided, of course, that you will accept my unsupported word that what I tell you is true."

Rutherford is not one given to making statements that are not true. If he says he knows a thing to be so, from personal knowledge, that settles it. He always was that way, even in school. More than once I have known him to take a licking when, by simply mis-stating the facts, he would have saved himself. Knowng him as I did, I told him to go ahead and give me the proof, if he wanted to, but, that I'd take his word for the "reason" wthout any further evidence. I hadn't the slightest idea as to what his "proofs" were, or I should not have taken the chance of missing them. Aside from a tale of fiction, I've never heard, or read of anything that approached his story for horror. And the setting was perfect. Rutherford and I, alone in the hunting lodge on the shore of a northern lake at night, with the November wind howling through the trees that surrounded the house on three sides, and driving torrents of rain and sleet against the windows and upon the shakes that covered the roof. An eerie night, for an eerie tale.

"I've never told this story before," he began, "because there is little chance of being thought anything but a liar. I've often wanted to tell it though, and this moment seems very opportune. Every word is gospel truth."

"In this case, as in all others, cause and effect are operative," he began. "If I hadn't caught the flu in the winter of nineteen hundred and five, I should never have known anything about it.

"I had a pretty bad case of it and, only by the skin of my teeth, did I manage to pull through. Even at that, I barely missed 'going west,' for I was left with a lung complication that my doctor thought was a touch of T.B.

"As soon as the weather permitted, he ordered me into the mountains for an indefinite time. 'Any place,' he said, 'where there are lots of pine trees and clean air.' It seems odd that, out of all the familiar places on earth, which I might have chosen, I should have selected a place I had never heard of before, just because the name, when I read it on the route marked out in a railway time table, reminded me of a little girl I used to like back in my school days.

"Maybe you will remember her, Elsie Hampton. She went to school with us, back there, in Stowe, Vermont. She lived back on the hill, beyond the big house that Butler, the hotel man, built. You remember, he never finished it? Got killed by being thrown out of his buggy, while driving a crazy horse. Drunk at the time, if I remember correctly."

I nodded and, refilling his obnoxious pipe, he went on.

"That's how I happened to go to Hampton and, as it turned out, I would have had some trouble finding a better place, every thing considered. It was two thousand feet above sea level, just at the edge of the foothills. There were plenty of pines, firs and balsams. Air as clear as crystal. Fishing and hunting 'till you couldn't rest and, to make it more attractive, it was off the tourist track. Nobody ever stopped there (it was before the days of 'Automobile Tramps' and there was no such thing as a 'Tourist Camp').

"But the town was modern and up-to-date, provided with gas, electricity and a plentiful supply of pure water, piped from a reservoir ten miles back in the hills. There had been a hot controversy over the construction of the reservoir, due to the heavy cost, but the 'Boosters' had won out, and in the end, every one was happy.

"I had been there but a short while when things began to happen that set the town by the ears, particularly that part of the town that had opposed the idea of putting in the reservoir. One beautiful afternoon, just at the time the women were getting supper started, every tap in town went dry. Inside of half an hour the water works department was being called up and 'called down' by indignant housewives, who wanted to know what had become of their water supply.

"Well, the department found it out almost as soon as the women did, and it wasn't long before the engineers were loping along the pipe-line leading

PRE-HISTORIC monsters are no novelty in literature, but here is one so totally different and so well pieced together that by the time we got through reading it we were not at all sure that our new author's story was not entirely truth. We promise you an interesting half-hour with this most excellent tale.

to the reservoir, followed by a crowd of idlers; being one of that class, I was with them.

"There was no break in the pipe and no cause for the stoppage of the water ways found until the reservoir was reached. Here they found cause in plenty. The huge, artificial lake was dry and the creek that fed it was pouring into a great hole in the center of the basin, near the dam and, from the roar that issued forth, one could guess that the water was falling some distance.

"Ordinarily, a hole may be stopped up. This was more than a hole; a continuous stream of water of considerable size failed to fill it. Evidently there was a cavern, or a number of caverns, underneath the surface with outlets, possibly sufficiently large to carry away any overflow.

"There were two newspapers in Hampton. One backed up the 'Boosters,' while the other stood with the 'Conservatives,' and the reservoir incident furnished the rival papers with a plentiful supply of material for publication.

"As might be guessed, the conservative organ was mean and caustic. Of course, nobody could have foreseen such a catastrophe—for it amounted to that.

"The other paper tried to explain, and really did explain. The cause was entirely obvious. The creek, for at least that part of it that had passed over the spot where the hole now was, had flowed over the thin rock cover of an underground chamber, or chambers, of huge dimensions. In view of what occurred a year later, I believe there must have been at least two, or more. This thin plate, or cover, had been strong enough to support the weight of the stream, but it was constantly growing thinner and it was apparently not strong enough to bear the greater strain imposed upon it by the water in the reservoir.

"The conservative paper admitted this but tried to convince its readers that the engineers should have known, from the formation of the rocks, that such an accident was liable to occur.

"And so they went at it, hammer and tongs, until, like a bolt from the clear blue sky, came another phenomenal occurrence. This, I suppose, might have been anticipated, although I don't see how.

"A MAN by the name of Wilson owned a large farm that abutted upon the creek. In fact, a part of the lake formed by the reservoir encroached upon Wilson's property, and would have covered a large part of it, were it not for a retaining wall that had been built to keep the water back. This wall ran from a point near the upstream end of the reservoir to within a hundred feet of the dam. The remaining space was filled by a sort of mound, rising some fifteen feet, or more, above the surface of the water at high level. This mound was very much like a turtle's shell in shape, a hundred feet in length, about fifty feet wide at its base. I mention the mound at this point in the story, because it played an important part in a later incident, and I want you to remember the details.

"One morning, while the principal topic of conversation was still the reservoir cave-in, Wilson came into town, all het up! Winding up in the Mayor's office, he sprung a sensation upon that official by declaring that his farm had 'sunk out of sight.' This was, to be sure, a mean and unusual trick for a farm to play upon its owner and the Mayor was both astonished and sympathetic. Wilson didn't want sympathy; he wanted damages, which put an entirely different light on the story. At first, the Mayor thought Wilson was crazy, but he soon changed his mind and, calling in the County Attorney, asked Wilson to tell the story in detail.

"Wilson said he had been aroused from sleep by a strange noise, a sort of tearing sound mixed with a great roar and, upon getting up and going to his window, which faced the reservoir, he had seen a great gush of water, spurting up through the hole in its bed, and that a few moments later there had been another tearing, crashing noise and all his best garden land had broken away from higher and less valuable land, and 'dropped plum out of sight.'

"He was still standing, open mouthed, at the window when there came another explosion, followed by a tearing noise and a great chasm appeared in the northern end of the depression into which his farm had sunk and through this came a rushing volume of water. By this time, Wilson said, he thought he'd 'better put on some clothes and investigate.'

"Continuing, he said that, when he reached the side of the cave-in, he saw that it was rapidly being filled with water that came pouring into it through the rent in the upper end. He had watched until morning when, the water, having reached a point a few inches below the firm edge of his remaining land, had ceased to rise, and he concluded it had gone as high as it ever would.

"At first he was mystified, but at last decided that his misfortune was due to the cave-in of the reservoir, the water having washed the underpinning from beneath his property. Well, both the Mayor and the County Attorney agreed with him—forgetting in the excitement induced by the fantastic story, that Wilson was there to secure damages.

"Of course the Mayor couldn't do anything for Wilson, and the County Attorney, seeing no better way out of the tangle, advised the man to get a lawyer and bring suit.

"The case didn't come to trial—not then—for the city figured a way out of the trouble into which the cave-in had drawn it.

"Analysis showed that the water in the newly formed lake was the same water the city had been getting from the reservoir and so an appraiser fixed a valuation upon the sunken property that satisfied Wilson, and, this settled, preparations were begun to connect up the lake with the pipe line.

"But, the chain of unusual happenings was not yet at an end. The day before Wilson was to receive the money for his land, water began to flow through the hundreds of taps that had been left open since they ran dry. An investigation revealed the fact that the reservoir had begun to fill up again and, as soon as the news reached the County Attorney's office, payment to Wilson was held up, pending such a time as might be needed to show whether or not the reservoir would fill and remain full.

"When it became apparent that there was to be no more trouble with the water supply, the City called the deal off. Wilson then took his case into court and lost. He carried it up on an appeal, and lost again, the higher court sustaining the lower and justifying itself in so doing by stating that what had occurred was 'an act of God,' for which the city was not liable.

"During the trial, I became acquainted with Wilson and, afterwards he invited me out to his place. I was glad to go with him for his invitation carried

with it the assurance of better conditions of living for me, for I had been unable to secure suitable quarters in any of the farm homes outside of Hampton. I conjectured that, if Wilson's place suited my fancy, I could very likely make arrangements with him which would enable me to remain at his place indefinitely. I did succeed in doing so and, who knows but that I might have met with the same unpleasant experience he did, had not Fate willed it otherwise.

"Adventure, like romance, lies just around the corner. One does not need to go to Africa, as these scientists are doing, in order to find adventure any more than it is necessary to go to Europe for romance, and the adventure ahead of me that summer day, as I sat in Wilson's rattling Flivver, en route to his place, was very real. No other man ever lived through an experience more bizarre, more horrible than the one that was waiting for me, at Wilson's place.

"It didn't take us long to cover the distance between Hampton and the farm which, even with most of the tillable land under water, was a beautiful place. That part of the property covered with the water from the reservoir had been practically the only really flat land in the whole estate; the rest was rolling and hilly, and for the most part, covered with timber. The lake lay almost in the center of the 'farm,' as Wilson called it and, while it completely ruined the farm for agriculture, it added immensely to its charm and beauty. Roughly oval and nearly a mile in diameter, it twinkled in its bed like a great sapphire encircled with emeralds. Owing to its depth, which, according to Wilson's estimate, was something about five hundred feet, the water would remain cold always, which made it an ideal place for any trout which entered from the creek, to live and breed in.

"I said as much to Wilson that evening after supper. Evidently, he had never thought of such a thing; his mind was centered upon his loss. He mulled the thing over in his mind for a moment, and as the possibilities of such a proposition grew upon him, he said, 'if that danged lake had fish in it, I wouldn't take any price you could name for it. I could get more out of the water then than I ever got out of the land and still own it.' And I knew he was right. Given fish, he had the world by the tail. It would make a wonderful summer resort, for cottages could be built along the lake which would bring high rent for the season. He surely needed fish.

"AND the fish came, but not until we had about given up all hope that they would. I had become Wilson's star boarder, for he had invited me to stay there as long as I liked, as his guest. I spent the days helping Wilson keep house. He was a widower for some years, and wandered about the lake, looking for signs of fish.

"Then, one afternoon, just at sun-down, I saw one leap out of the water. I shouted to Wilson, who answered the call on the run and got there in time to see another one jump up out of the blue depths. He gripped my arm and said, 'Rutherford, I shall need some help, financially. If you want to go in with me, we'll split the profits. What do you say?' I thought the matter over for a moment, then told him I'd furnish the needed capital. We stayed there, at the side of the lake, until dark, talking the matter over and watching the 'dollars,' as Wilson was pleased to call the trout, jump out of the water. We then went back to the house to make further plans for the next season.

"Two weeks later we had a dozen summer cottages well on the road toward completion. We expected to build more, later, but we figured a dozen, to start with, would be sufficient, which shows how nearly a couple of greenhorns can come to making a correct guess. We could have rented a hundred, if we had them. Later I wished I had never thought of building a single cottage. But who could have dreamed of such consequence?

"The cottages, which were erected on a sufficiently large, cleared space, on the southeast shore of the lake, were completed before the cold weather set in, and after closing the board shutters over the windows to protect them from possible breakage, we devoted our time to planning a campaign for the Spring.

"Winter passed reluctantly it seemed to Wilson and me, but it gave way to Spring at last and shortly after I went to the city. There I had a series of talks with certain dealers in fish, which resulted, as soon as the fishing season opened, in a big window display of strings of trout that made the disciples of Isaac Walton almost wild to swing a fly over their habitat. A carefully worded legend that accompanied the display gave the necessary information. The season opened with all our cottages occupied and we were making money.

"VERY shortly after, we began to hear strange noises, in the night. If we had been very near a seaport town I should have thought the sound, though rather sharp, was given by a ship's siren. However, since we were better than eighteen hundred miles from the ocean, and a thousand miles from any other body of water large enough to float a ship, we concluded that it was a particularly awful whistle on the railroad, that ran some three miles to the west of us. It bothered us for about a week, then, like all other noises that occur at frequent intervals, it ceased to bother us much. There was some speculation among the cottagers but, when we told them it probably came from some engine, they accepted the statement for fact, and forgot all about it. Besides, what does a little noise amount to when the fishing is good? And it was.

"There was only one fault to be found with our lake, or its environment. Owing to the altitude and the added fact that it lay so deep down among the hills, the nights were too chilly to permit of comfort on the lake after dark. However, there was plenty of warmth during the daytime, so it didn't matter so very much.

"Along about the first part of July, however, we had a stretch of very hot weather. The warmth continued well into the night, and the early evening hours found the lake pretty well dotted with boats and canoes, passing back and forth near the shore and pretty well out into the lake.

"The first break in the calm order of our lives came one evening, during this hot spell. Wilson and I were down at the lake, cleaning some trout we had caught. It was about eight, or a little later and it was getting dark rapidly. We had practically no twilight. We had just finished our job when a long, agonizing scream, as one in mortal anguish, came vibrating over the lake, from some point down in the southwestern corner. Dropping our fish, Wilson

and I ran down the shore, in the direction of the cottages, only to find all the women, and a couple of men huddled in a frightened group, down by the shore. In reply to our queries, one of the men said that the scream came from young Barnaby who, with his father and mother, occupied one of the cottages.

"As it chanced, no one had been out on the lake, except the young man. All the other men, with the exception of the two who were on the shore when we got there, were in Hampton, laying in more supplies. When his mother called to young Barnaby to come in, he answered he would be 'back in a few moments,' but for some unearthly reason, had started toward the deepening darkness of the western shore. The boy's mother had remained on the cottage porch, following the lad with a mother's anxious eyes, as he paddled away into the shadows. The two men, also watching from the shore, commented upon the boy's 'whim.'

"Up to this point there was perfect agreement; then started differences of opinion, as to what followed. One man said he was certain the boy had started to change ends, in the canoe, and had capsized it in so doing. His neighbor was equally certain that he had dimly seen the young man stand up in the canoe and, with the paddle, strike at something and then suddenly pitch forward, out of the canoe, screaming as he fell.

"ALL this was told by the two men, while the four of us, in two boats, were racing toward the spot where the boy was last seen.

"Although the man who declared the accident had been due to the boy's attempt to 'change ends' still stuck to his opinion, I felt, somehow, that he was wrong. Barnaby was, I had been told, a crack swimmer and, considering that he must have been close to shore when he fell into the water, I was convinced that merely being capsized would hardly have elicited such a cry of agony. No! I felt, absolutely, that there had been some sort of an attack made upon him and that he had tried to fight off the attacker, whoever, or whatever it was, with his paddle, and that he had failed in the attempt. And, as I tried to guess what sort of danger the unfortunate boy had faced, chills of horror went down my spine.

"So thoroughly convinced was I that something terrible had happened to Barnaby, and that he was beyond help, that the sight of his overturned canoe, as we drew near it, acted only as a sickening confirmation. Yet, knowing that it was useless, I urged a careful search and, with the others, called his name, again and again. They may have hoped; I did not. I merely knew the boy was dead.

"I kept my thoughts to myself, however, since voicing my suspicions would only make matters worse. It would be bad enough to believe her only son had been drowned, but, I doubted whether her reason would bear the shock of the awful thing I had in mind. Wilson followed my example.

"Having no grappling irons, we would not drag the lake that night, but I told Mrs. Barnaby, who bore up remarkably well, that I would get some from Hampton in the morning. Hampton had none, so we had to devise them from clumsily made heavy rods and hooks.

"Young Barnaby's father wanted to go with us, but I prevailed upon him to remain with his wife. I felt it was best, because, while I did not expect to recover the body, I realized the possibility of something very sinister, and I felt it would be better for him not to see what the irons might bring to the surface. Maybe he sensed something of my thought, for he consented at last to remain behind.

"We loaded the clumsy drag with the rope attached (I had bought eight hundred feet, in order to make sure we had enough) into the boat and, with Wilson at the oars, pulled over to the place where the accident occurred. We had some trouble getting the drag into the water, owing to its awkward shape and weight, but we finally succeeded in lowering it. It seemed as if the drag would never reach bottom. Five hundred feet is a long way down.

"When, finally, the drag came to rest, I sat down in the stern of the boat and told Wilson to row slowly. He did. He did even better than that; he hardly moved at all. I thought the drag might have caught on some snag, but Wilson assured me there was no such thing in the whole area of the lake. It required the combined efforts of eight men, two to a boat, to pull that thing.

"We worked all day, dragging every foot of the lake within a radius of several hundred yards from the spot where the boy went down. We found nothing that day nor the next day, nor any day within the week of heartbreaking labor.

"It was labor lost, but it was necessary. There was no use running the risk of, not only driving a mother and, perhaps, a father crazy, but of ruining our business. And, of course, I might have been mistaken.

"The Barnaby cottage was vacant the day after we ceased to drag the lake, and it looked, for a while, as though the others might be, too; but, after talking the matter over, the occupants decided that it was only an accident, sad, indeed, but only too common and, since going back home would not help these parents to recover their boy, they might just as well try to forget it. So they stayed and the vacant cottage was soon rented again.

"One thing, however, they didn't forget—that the 'accident' happened in the evening; so, although the warm spell continued, they kept off the lake after sundown.

"Nearly a month went by with no untoward happening. Even those night noises ceased and I began to think I had let my imagination run wild, and that young Barnaby's death had been due to a simple capsize of his canoe. Then, there was another accident and, this time, it was a particularly horrible one. To add to its sinister aspects, it took, for its victims, the young couple who occupied the cottage in which the Barnaby family had lived.

"The young man and his wife,—their name was Whipple,—had been married only a little over a year. Mrs. Whipple, a rather frail woman of the neurotic type, temperamental, crochety and stubborn as the Devil, was soon to become a mother and her condition, of course, didn't make her any easier to get along with. She was a beauty, though, and Whipple adored her.

"But, unreasonable as she was, Mrs. Whipple realized that she was in no condition to risk being tipped into the water, even if she had been a good swimmer, so she kept off the lake, contenting herself with sitting in the bow of the boat, which was tied to a stake driven into the ground, a few feet from the edge. There was absolutely no shore, no beach, and the water, at the edge of the lake, grew suddenly deep.

"No one will ever know what prompted her to insist upon going out on the lake that night. Probably it was just an unaccountable whim, common to women. Had Whipple been a little more coaxingly diplomatic, he might have talked her out of the notion, but, unfortunately, he emphatically negatived her suggestion that he take her 'for a little boat ride' before they went to bed, and the fat was in the fire. What had been, when made, just a simple, wheedling request, became a demand, backed up by evidence of approaching hysterics.

"According to Holy Writ, which is accepted by many people as being true, Eve succeeded in getting Adam to eat the apple, even when he *knew* the consequences were going to be disastrous, so what could be expected of a man, so deeply in love with his wife, who only *feared* the *possibility* of an unpleasant result of his yielding? Whipple held out, for a little time but, in the end, she devilled him into taking her and, to make the matter worse, she insisted upon going, 'straight across to the opposite shore and back.'

"I was present at the time; that is I was within hearing distance, having been engaged in conversation with the man next door to Whipple. When I heard him, grudgingly, consent to take his wife across, I had a feeling of dread, a premonition of something dreadful in connection with it. Using all the tact I possessed, I tried to dissuade her from going. But it was useless. She listened, politely enough, for she was well brought up, but she was unshaken and what more could I do? True, I might have taken hold of the painter and refused to allow Whipple to take the boat, as I had a 'hunch' to do. But that would have necessitated an explanation, which I could hardly give. So I contented myself with saying that I wouldn't do it under the circumstances. Which helped not at all.

"I've known people to laugh at 'a hunch.' They claim there is nothing to it, that the 'feeling' is due to some trifling nervous disorder, entirely physiological. Some attribute it to over-stimulation of the nerves by alcohol, or tobacco. Well, perhaps it is due to any one, or all of these causes, but I've never known it to fail in my own case, and I've had plenty of chance to test it out. The proof, of course, is entirely one-sided, for, if I 'feel' that I'll be sorry later if I do a certain thing, and I obey that 'hunch,' I never know that punishment would really have followed had I disregarded the feeling. It is like taking the Pasteur treatment for suspected rabies infection. If the treatment is taken before rabies develops in the person, it can never be known, for certain, that there was any need for the treatment. All that is known is, if there is an infection and the treatment is not taken, the person dies, most horribly. So with a 'hunch.' It may be all bunk, as the cold-blooded, matter-of-fact people claim, but it doesn't cost much to play the 'hunch' and, as a rule, I do.

"I STOOD there, on the shore, watching the outline of the boat grow dimmer and dimmer as it neared the middle of the lake. It was the second night of the new moon. The starless sky was like black velvet. And it seemed ominously still to me. At the first terrible ullulation of a woman in deadly peril, which came echoing across the black stretch of water, I felt, not so much of surprise, as confirmation of a previous certainty. None the less, my very soul sickened with dread and horror and when, an instant later, the hoarser cry of a man smote my ears, I knew the tragedy was complete—both Whipple and his wife were past help.

"I must have been very close to hysteria for, when Wilson, whose teeth were chattering, grasped my arm, I shook him off with an oath, and ran for the boat, closely followed by the other men.

"As a rule, I am not much bothered by 'nerves.' It is not due to any courage of an unusual sort, for I have known fear many times, but I certainly had them that night, when we pulled across the lake, toward the spot from which had come those terrible cries. Although I have crawled out into the mud and filth of 'No Man's Land,' in the blackness of a rainy night, knowing that death would be my portion if I should betray my presence by a sound, my nerves were steady although fear was in my heart. I knew in what manner I should die and the knowledge helped. But the awful mystery that lay behind the need for going out on the lake shook me and, had any one touched me, suddenly, I am sure I should have screamed.

"A hundred yards distant from the farther shore we came upon the boat and drew alongside of it. It was empty. Suddenly my eye caught sight of something white at the bottom of the boat, near the stern. Pulling the craft along, I reached for the object. It was a bit of muslin, torn from a woman's dress, and remembering that Mrs. Whipple had been wearing a white dress that night, I turned sick.

When I lifted my hand from the gunwale of the boat, preparatory to beginning a search that I knew would be fruitless, I noticed that it felt sticky. It struck me as strange, since the boat had not been lately painted. I was about to dip my hand into the lake, to wash it when a thought struck me. Lighting a match—for it was too dark to see anything clearly—I looked to see what had befouled my hand.

"It was blood.

"Wilson had been watching me and, as I hastily dipped my hand into the lake, with a shudder I could not prevent, he asked, in the tone of one who dreads the answer, 'Was that—' He didn't finish the question. I nodded and I felt the boat quivver as a spasm of shaking seized him.

"We knew, but we continued to search—we and the others, who had caught up with us. Although I was ignorant as to what it was that had brought about the death of three people, I was certain there was something sinister and terrible in that lake of ours, and I was afraid.

"When we dragged the lake, we found no bodies—and I knew there would be nothing left to find.

"This ended our enterprise. One week after the last accident found every cottage vacant. And no wonder. Not only were the women wrought up to the breaking point over the affair itself, but their nights were made hideous by their dreams and the infernal sound of that siren, whistle, or whatever it was which grew increasingly worse. It was a heartshaking sound.

"After the last of our guests had packed up and gone, Wilson and I determined to solve the mystery, for we were convinced there was a mystery hidden somewhere in that lake.

"Fortunately for us, nothing had been said concerning the disappearance to arouse suspicion in Hampton. It was known that some people had been

drowned, which was, of course, unfortunate, but not unusual. And we did not further enlighten them.

"I have no idea just what it was that suggested a connection between the sounds that disturbed our slumber and the happenings on the lake, but I found myself associating them in my mind. Wilson, when I mentioned it to him, scoffed at the notion. 'How,' he asked, 'could a noise tip a boat over?' and when I tried to explain that the thing that made the noise might be the cause, he wanted to know how a locomotive could leave its rails and accomplish such a thing. You see, he had accepted as fact, the idea that the sound we had been hearing emanated from a mechanical contrivance. I told him my idea of the situation and I'm inclined to believe that he thought I had gone crazy, for when I asked him to put in a night with me, trying to locate the noise, he refused.

"In deference to his opinion that the disturbance could be traced to some engine, I made it a point to investigate. The men were very courteous and obliging, and blew the whistles of engines that traveled over that stretch of the company's right of way, but none of them gave forth the sound, the origin of which I was trying to discover.

"I told Wilson about my findings, and when I told him I was convinced the noise came from the lake, he consented to stand watch with me, but I could see that he took no stock in my belief.

"For three nights we watched but heard nothing, and Wilson was ready to drop the matter. I had a hard time getting him to go out the fourth night, but grudgingly he came with me.

"Since the noises seemed always to have come from the southwestern shore and, because it was there the accidents had occurred, we had used that as our watching post. Unlike the eastern shore, which was open and fairly flat, the western side dropped sharply down to the water. Some of the trees, their footing broken away by the cave-in, lay flat in the water, attached to the shore only by their roots, their branches obscuring considerably the nearer reaches of the lake.

"We found one tree which had rooted a little farther back from the line of break, had therefore, partly escaped the fate of its fellows. Held by its roots, it reached out over the water, at an angle of some twenty degrees. It was a large conifer and its tough branches with broken limbs placed across them, afforded a safe and comfortable resting place, although being out over the lake and with nothing to break the wind, it was far from warm. As I have said already, the nights out there were cold.

"There were no dangerous land animals about, so we carried no arms and, I feel sure any arms we might have taken would have been useless against the creature we were hunting. So, with a packet of lunch and a thermos bottle of hot coffee, Wilson and I set out for our point of observation.

"The night was clear, when we started from the house, but, after an hour or so, it began to thicken and a mean, cold drizzle set in. We were warmly dressed, however, so, aside from the ordinary discomfort of damp skin, wherever it was exposed, we suffered none.

"It was, as nearly as I could judge, (I didn't think of looking at my watch) about half past ten o'clock when I was aroused from a half doze by an odd noise that I could not for a moment classify. It woke me up, however and now fully alert. I waited for a repetition of the sound. I heard it again presently, and this time I recognized the sound. It was a grunt, a regular hog's grunt. If it differed in any respect from the familiar vocalizations one hears coming from the pig-pens, I didn't realize it at the moment, although it did seem to be an unusually healthy grunt.

"My only feelings, as I remember, were those of mild astonishment; not so much because I had heard the grunt of a hog, (which might have escaped from its pen and wandered down to the lake), but because the sound came from the lake, and not from the land.

"THERE is nothing in the sound of splashing water to scare one. Yet, there by the lake, with the cold drizzle wetting my hands and face, I shivered when I heard that noise.

"Wilson, his back against a crotched branch, was fairly asleep, (though he swore he wasn't) and I was in the act of waking him when, like a blast from the siren of an ocean liner, the most awful roar I ever heard, tore through the night air, from out there in the darkness, nearly shattering my ear-drums.

"It fairly brought me to my feet and, as for Wilson, if I had not been lucky enough to grab his coat, as he was disappearing downward, through the branches of the conifer, what happened to him later, might have happened to him that night.

"I had only just recovered from my mental balance and got Wilson back to safety when it came again. And I knew it was the same screaming noise we had been hearing all the time. And I knew also that that noise was in some way responsible for the distressing disappearances of our tenants, and I knew that the originator of that sound was of enormous size.

"It would be difficult to adequately describe my feelings, as I sat crouched there upon our none too secure platform, peering out into the black darkness, trying to discover what manner of creature it was that had given voice to that soul-shaking scream. Fear I knew, but there was something else beside fear; something of unrecognized dread; perhaps a premonition of some dreadful occurrence. And when the splashing sound came nearer, I had to exercise great self-control to keep from backing out of those branches as quickly as possible and out of the neighborhood. And Wilson, I believe, was even worse off, for his teeth were chattering and he seemed dumb with fright.

"Then the splashing noise gave way to another sound, this time to a swishing, sucking sound, like that made by an oar, pulled forcibly through the water. Whatever that thing was, it was swimming, not like our ordinary animal swims,—by moving its legs—but, rather after the manner of a seal—by paddling with flippers. And it was heading toward the north end of the lake.

"As the sound of its movements through the water came from directly in front of us, I dimly perceived, like a vague, black shadow against a wall of blackness, a vast, undulating body. I could not make out its shape for there was not light enough, but I knew it was enormous and, as I thought of it in connection with the terrible screams of those unfortunate men and that helpless woman, the muscles of my throat tightened and—I am not ashamed to admit it—tears filled my eyes. Wilson apparently had been following the same line of thought. He was almost un-nerved, and sat there picking at his fingers and

repeating, over and over, 'Poor little woman! Poor little woman!' When I could stand it no longer, I shook him and made him shut up.

"When the last of the monster's shadow had passed, we painfully rose from our cramped position and crawled back to shore and started for home, around the north end of the lake, hoping to get another and, perhaps clearer view of the monster. But we didn't catch sight of it again. Perhaps it changed its course or, more likely, had sought its hiding place.

"I am not a drinking man but when we reached the house and Wilson poured a stiff peg of liquor for himself, I asked him to give me one too. And we needed that drink if ever any drink was needed, for we were pretty badly shaken up.

"It was long past our usual bed hour, but we didn't feel very sleepy, although probably from force of habit, I suggested turning in. Wilson, however, much to my secret delight, refused to take any chances of dreaming about that thing. 'No, sir!' he said, 'I'm going to keep my clothes on and stay awake.' So, after another drink, we filled our pipes and prepared to wait for daylight.

"'What kind of a fish was that?' Wilson's question aroused me from the train of thought into which I had wandered and, my mind engaged, I replied, an aquatic antique. This did not, of course, make things any clearer for him so I asked if he knew anything about the history of the earth, and the strange creatures that had lived upon it, in ages long past. His knowledge was very limited so, drawing on my memory of lessons learned years before, I tried to answer his query in such a manner as to enable him to understand the probable meaning of what we had seen.

"So far as repeating what I had read was concerned, my task was simple. But any proper answer, that is, one that would cover what we had dimly glimpsed out there on the lake, required something more and I was obliged to resort to deductive reasoning in order to supply it.

"Briefly I told him that the age of the earth was estimated to be between 860,000,000 and 1,000,000,000 years and that, according to the age of the rocks, this great span of years was divided into ages, such as the Azoic, followed by the Palæozoic, Mesozoic and Cenozoic. I told him that, accepting the idea that roughly 1,000,000,000 years represented the earth's age, the Mesozoic era lay back of us some 500,000,000 of years. Then I told him, as well as I could, what sort of monsters and giant reptiles inhabited the earth and its water at the time; then, in an effort to account for the monster in the lake, I drew upon my imagination. Perhaps I guessed wrongly, but I know of no other way. For there is no record, so far as I know, of any creature, except some of the land species possibly, that could equal, in size, the thing whose shadow we had seen.

"I am inclined to believe I was not far wrong because it is common geological knowledge that vast continental changes were taking place at that remote time, and basing my conjecture upon that fact, I told him that during some of those tremendous upheavals, certain ones of the reptile family had probably been caught in some of the great caverns that were formed and, unable to escape, had adapted themselves to their changed environment.

"True it was, that this thing was different from any species known, but is it *certain that all the reptiles that lived away back in those ages had been classified?* I wasn't at all certain that they had been, so this creature might be a direct descendant of some distinct and unknown class. Or, I thought it might be possible that reptile might be some sort of hybrid, bearing a composite resemblance to its ancient forebears. Why not? If you can crossbreed asses and horses and get offspring which, though unmistakably different from either of its parents, in all essential features, resembles both, why could not some similar sort of crossbreeding have occurred with members of the reptile family?

"All sorts of fossil remains of pre-historic reptiles have been discovered in North America, and those creatures, when alive, lived here. Moreover, America, it is known, is fairly honeycombed with caverns, some of enormous extent. Many have water in them; although not sufficient, perhaps, to accommodate a lizard as large as this particular one. Is it certain that *all the caverns have been discovered?*

"Take this particular case for an example. When the bed of the reservoir caved in, where did the water go if not into some vast cavern, or caverns? And, had there not been such a cavern or caverns under the bed of the creek, would there have been any cave-in? Of course not.

"Following this line of deduction, I came to the conclusion that, in the subterranean depths, this reptile, with perhaps many others, had been born and, since even a lizard cannot live in water that is entirely stagnant, inlets and outlets must have existed, to keep the water, at least comparatively fresh.

"SPACE alone, is limitless, so there must have been a limit to this cavern or caverns and, when the water broke through from above, it was filled to the point where the rock walls were burst and the earth, having lost its support, fell, forcing the water upward and forming the lake. When the water reached a certain level, or was on a plane with the bed of the creek, the reservoir filled up again, underground, the outlet having been too small to carry away the flow of the stream If my premise was correct, then the presence of the lizard in our lake was easily accounted for. It simply came up through the same hole through which the water came.

"That was the explanation I gave Wilson and I thought, and still think, that it was correct.

"After breakfast I went to the north end of the lake. I believed I had hit upon the real solution of the reptile's presence in the lake and wanted to verify it if possible. I had an idea that the lizard might take it into its head to come up from below, and give me a chance to see it. I wanted Wilson to accompany me but he said he had too much work to do about the place.

"I waited near the hole until about noon, but seeing no sign of it, I concluded that it had either come up early or, what was more likely, was hiding down there in the darkness, until nightfall. Instead of turning homeward, however, I decided to settle another question. For some time now, we had seen no trout jumping and I thought they might have been frightened out of the lake and returned to the reservoir. Wilson and I, although we did not know until the night before, just what had caused the accidents, thought it better to go without fish than to take any risks out on the lake. But if they were in the reservoir again I meant to catch a few.

"The knoll, or mound, about which I told you in

the beginning, lay directly between me and the reservoir and, since it was easy to climb, I started up its side. It was covered with low brush and weeds that hid the surface of the ground from view, but did not greatly impede my progress. I plowed my way to the top and started across the rounded back, toward the reservoir. I had gone only a few paces when, without warning, the ground gave way beneath my feet and I soon found myself, in a heap, in the gravel, at the bottom of what seemed to me to be an over-sized cistern.

"I was not injured but I was considerably shaken up, for I had fallen about ten feet. For a moment I was inclined to laugh at myself, for I cut a funny figure sitting there, hunched up. But there was nothing to laugh at. I found myself in a serious position, for I was imprisoned at the bottom of a hole, surrounded by unscalable walls of loose gravel. Moreover, no one had seen me at or near this isolated place, so unless a miracle happened, no one ever would come in time to find me alive. Well, sitting there, staring at the opening through which I had fallen would do no good, so I began to take my surroundings into serious consideration.

"It soon became evident that the hole had been dug by some one for a definite purpose; what that purpose was I had no idea. The opening at the top, I discovered, had been covered with planks which, in the course of a short time had become covered with earth and vegetable matter; in turn this furnished soil in which had grown the weeds that hid the spot. None of the boards had fallen into the hole, nor was there anything I could use to enable me to reach the opening. As there was nothing else I could do, I decided to kick gravel from the walls and heap it up until the pile was high enough to enable me to reach beyond the broken boards, grasp some bush, or other thing, and get out.

"I knew I had a tedious job ahead, for I had only my hands to use as a shovel. At one side of the hole, quite a pile of gravel had fallen of its own weight, which gave me a good start, I thought. Throwing double handfuls into the center of the floor soon proved to be a bad job. My hat also proved too slow a method, so I spread my coat, filled it, then carried it over to the slowly growing mound, on which I dumped these accumulations.

"I had a heap about three feet high when, in scooping up another double handful, my fingers came in contact with the surface of a box. I soon had it uncovered fully and found it to be about a foot deep, fifteen inches wide, and about two feet long. I was about to kick the cover off, in order to find out what, if anything, it contained, when I was moved to examine it a little more closely first. It was a good thing I obeyed the impulse, because, after carefully prying off the cover, which had begun to show signs of dry rot, I discovered a two gallon cannister of nitro-glycerine.

"The reason for the hole became apparent at once. It had been used as a chamber for explosives while the reservoir was in process of construction, and this box very likely had been overlooked when the work was finished.

"Very carefully I carried it over and laid it on its side, on top of the little heap of gravel. Digging further I found another box, and another, until I had found fifteen. I piled these, pyramid fashion, under the hole through which I had fallen; then holding my breath and taking care not to make a false step, I climbed to the top and soon found myself in the sunshine once more where I could breathe freely.

"WHEN I reached the reservoir, I found the trout jumping. The fish problem settled, I started back toward the house for my tackle. I was about half the way to the fence when I saw Wilson, a long stick in his hand, trying to head off a cow that had broken from the corral, and was now headed for the lake.

"Mules are supposed to be, and are, stubborn, but when it comes to downright 'orneryness,' I think a cow is pretty much of a fool. Added to this, cows are nervous things, ready to stampede at a moment's notice and when they get a notion into their heads, you can't club it out.

"Now, this cow was a Holstein, and valuable so, when Wilson saw her heading for the lake he very naturally objected, considering the sort of tenant that lake harbored.

"I was too far away to be of assistance and the beast was too much for him alone. Dodging past his swinging club, she drove, head on, for the water, her tail, so it seemed, flapping, in derision. She was still on the gallop when she reached the water, so she went entirely under. I saw her come up, a few yards from the bank and, cow-wise, start for the farther shore. I don't know why a cow will always, under similar circumstances, make for the farthest point, unless it is because as I said, they are just plain fools.

"In his anxiety over his cow, Wilson forgot something he should have remembered: if the lake was a dangerous place for the Holstein, it was even more dangerous for him. But he may never have thought about the lizard at all. At any rate he ran to the little dock that projected out into the water, and, getting into the boat that was tied there, began to row frantically after old bossy.

"I was too far away to warn him of his danger, although it didn't actually seem great then; the lake, like a great blue gem bathed in the golden rays of the afternoon sun, suggested nothing further than dimpled beauty, made somewhat sinister by the knowledge that, deep down in its sapphire depth there had been, and might at the moment be, a nameless and monstrous horror. I guess I have become a bit of a fatalist; it seems to me, things are pretty much laid out for us from the beginning. We are supposed to be 'free moral agents,' according to the clergy, yet I wonder if we really are. Of course, Wilson did not *have to go out on the lake.* Nor would he have gone if he had stopped to think. But blame can hardly be attached to him for not stopping to think. He never did.

"By the time I reached the spot where the cow went into the water, the animal was about a hundred yards from shore, headed back, for Wilson had overtaken her and made her turn back. There wasn't a thing to be nervous about, so far as appearances went, but I was worried, and I urged him to hurry. He waved his hand and nodded and that was the last thing he ever did. His hand had barely grasped the oar again when, silently, from the blue depths, there came into view, just behind Wilson, the awful head and neck of the creature, whose shadow we had dimly seen that night, when we sat crouched on a

shaky platform spread over the branches of the fallen conifer.

"Up it rose, to a height of seven or eight feet, while I, gazing upon its utter frightfulness, stood paralyzed and dumb. I saw its cavernous mouth, fully three feet from snout to the angle of the jaw; saw it open and reveal its gleaming, needle sharp teeth over the head of the unfortunate man; and I was utterly helpless. If my own life had been at stake, I could not have uttered a cry of warning.

"I think Wilson must have sensed something, somehow, for I noticed (I can see that look even now) a look of fear spread over his rugged features. But it was too late for, just as he was in the act of turning his head to see what was behind him, the end came. There was a slight working of the terrible jaws, perhaps due to some sort of gustatory suggestion of the thing's instinctive machinery, then, like a flash, down came the obscene head, the jaws closed, with a snap and Wilson, only his legs protruding beyond the lizzard's snout, was snatched from his seat with the speed and ease with which a hen picks up a kernel of corn.

"Horror unspeakable overpowered my mind, and I think I lost consciousness for a moment. Maybe I went mad for a time, for I have no remembrance of having gone to the house, nor, until awakened by a terrific crash of thunder, did I have a realization that anything had taken place.

"When I regained my senses, I sat slumped over in one of the kitchen chairs. I felt dazed, like one who has been on a long drunk. Shadows of strange memories passed through my mind, suggesting nothing definite. Then another frightful crash swept the cob-webs from my brain and I felt memory coming back with a rush.

"Other things came quickly, and perhaps fortunately, to occupy my mind, and demand my attention, for one of the worst storms I had ever witnessed, was brewing fast and furiously. The house, stout though it was, trembled and creaked beneath the onslaught of the elements gone wild.

"Getting up from the chair I staggered to the window. The sky was overcast with heavy clouds, those immediately overhead being a grayish black, while, down in the southwest an unearthly, greenish mass of whirling cumuli, writhed and twisted, high up in the heavens. That there were several currents of air, coming from as many different directions was evident, from the manner in which the tops of the trees behaved. They fairly threshed about. Presently the temperature began to drop and great clouds from the northwest drove past, beneath the blackness far overhead, and then the flashes of lightning became appalling, as the fire forks darted from cloud to cloud, while deafening peals of thunder sent every loose thing a-rattle.

"Then the rain came; came in torrents that were veritable cascades of driven water, beating in at every crack and crevice. There was a blinding flash a hundred yards from the house and a tall tree, splintered into kindling, flew in all directions; this the gale whirled and tossed about, finally driving it into the lake, the surface of which was beaten into froth.

"I heard a crash overhead and knew the chimney had gone by the board. This was followed by a ripping sound, and the roof of the chicken house, looking like the flapping wings of some enormous bird, went sailing away across the lake; and when the house itself began to slide upon its foundation I expected it to follow. It did not, however; neither did it lose its roof, although, as I discovered later, there wasn't a whole shingle left on it.

"Suddenly the hideous racket was augmented by a sound that over-rode all other noises. Every window pane was shattered; every door was driven from its hinges, while through the openings, a deluge of water rushed, flooded the house and knocked me into a corner.

"I have heard about the 'Crack of Doom' many times, and, if it is going to be any worse than that crack, I don't want to hear it. However, it seemed to serve one useful purpose, for after it came, the awful racket began to subside and, within the hour, only an occasional rumble bore evidence of energy still at work. The rain continued, however, until it seemed the oceans were being drained to furnish the water.

"Wet, cold and weary, I waded through the water that swashed back and forth through the lower rooms, to the stair leading to the second floor. I dragged my aching body up the stairs, down which little streams trickled, for the windows, upstairs, also were shattered. I went from room to room, seeking some place of shelter out of the wind, where I might perhaps find some dry clothing and lie down. The second floor was pretty well soaked but I found shelter at last, in a large closet in the rear. This part of the house was toward the east and since the storm had come from the southwest and north, it was comparatively dry there. In this closet I found Wilson's Sunday suit, some shirts and a pair of shoes, together with a few pairs of socks. The suit was too small, and the shoes too large, but I was in no position to be particular, so I put them on. Unless you have been in a similar predicament, you cannot know the comfort of dry clothing of any kind or make.

"After wringing out my own clothes and hanging them over the backs of chairs to dry if the rain ever let up I piled some things on the floor and, upon these, for a bed, I soon forgot all about the storm and what had gone before it.

"A ray of sunlight on my eyes, reflected from a mirror, awoke me. My watch had stopped, so I didn't know just what time it was, although I judge it must have been about nine o'clock. I was a bit stiff and hungry, but otherwise, in pretty good shape. After drawing the chairs, over which my clothes hung, into the sunshine, I went down stairs, dug the wet ashes out of the stove, made a fire and cooked some ham and eggs and coffee for myself. Then I started out to learn the extent of the damage.

"There was plenty. The roof of the barn had fallen in, driving the walls outward. Luckily the weather had been warm, so the cattle were still kept outside. I found them at last, in a small apple orchard, apparently no worse for having been out in the storm, contentedly eating grass. I say had been, because practically every one of the trees had been ruined, the branches having been torn off.

"Then, for no particular reason, I strolled down to the lake. Except for a lot of floating shingles, branches and boards, it was the same, smiling, beautiful blue body of water—the last place in the world, I thought, where such terrible tragedies could take place, and the most unlikely hiding place for the horror that had caused the events. Soon I became aware of a muffled sound like a rushing of water

over a fall, and wondered what caused it. A little later, I noticed that the floatsam was drifting toward the north end of the lake. This was odd, since there was no current and, curious to learn why, I started in the same direction. Soon the muffled sound became louder. It was coming from the lake! Puzzled for a moment, like a flash the explanation came to me and I started north on the run.

"I soon reached the place where the noise came from—a great rent at the end of the basin in which the lake lay. I looked toward the mound, or, rather, toward the place where the mound had been, for it was there no longer, and if I had been in doubt as to what had caused the rent, I was soon in possession of full knowledge. That unearthly crash had been caused by the explosion of those fifteen cases of nitro-glycerine, and there may have been more buried in the sand, when a streak of lightning found its way into the pit in which they were.

"The rocky floor of the pit must have been a sort of pot cover, over the subterranean cavern, or caverns, and the force of the explosion had torn it away rending the rocks and earth into a great tear, extending through the wall which held the lake. It had done even more; it tore out the wall between it and the reservoir, for I found, upon going around the chasm to the dam, that the water was rapidly lowering. While I stood there, amazed at the force of the charge, a large block of concrete from the end of the dam nearest me, broke loose and fell with a splash, into water. Evidently, I thought, the whole dam was being undermined and was liable, at any moment, to fall. I made haste to get away from the place, and I acted wisely, for within ten minutes the whole enormous structure of concrete crumbled and fell; a part of it going completely out of sight in the hole in the bed of the reservoir, while the rest went in the opposite direction.

"It was apparent, since the chasm was enlarging momentarily, that it would not take long to empty both reservoir and lake and, being minded to see the finish, I went back to a point of safety, on the eastern shore, sat down on a rock and waited for the end.

"SITTING there, wondering into what profound depths the waters of the lake and reservoir were plunging, speculating upon the possible truth of some tales I had read concerning people discovered living in a 'World Beneath a World,' I forgot, for a time, what was taking place before my eyes.

"I was aroused from my reverie by a snort, and coming back to actualities, I looked to see what had produced it. There was the great lizard, from whose throat it had emanated, not fifty yards before me.

"At last I saw the monster, and monster it truly was. My powers of description are far too limited to adequately describe that monster. Its body, at least the upper part, was fully exposed. Swan-like in shape, it appeared to be nearly sixty feet from the point where the neck joined the body, to the end of its tail, which resembled, in a way, the tail of a duck. This body, armed or equipped with flappers, similar to those of a seal, but enormously larger, was a greenish black and was covered with what might have been, the slime and ooze of ages. Its neck, flexible as that of the swan, was fully two feet in diameter at its base, tapering slowly to the head, eight feet from the body. The head was a composite of the crocodile and the tyrannosaurus, but much larger, with loosely articulated jaws, permitting of tremendous extension, as is the case with certain snakes. The mouth, armed with teeth fully six inches in length, was at least three feet long from the snout to the angle of the jaws. To add to its frightfulness, the upper canine teeth, or fangs, curved outward and downward over the lower jaw, and were, as near as I could judge, at least ten inches long. A more horrible creature I couldn't imagine, and I wondered whether it might be a member of some species that had never been catalogued, or whether it was what it appeared to be, a hybrid. I think it was the latter and, since it was the only one that had come into the light of modern times, I also wondered if the thing could have begun its existence away back there in the mesozoic era. It seemed impossible, and yet, who knows. At any rate it certainly looked ancient enough to have been born long before creation began. Doubtless, I thought, there were others like it, somewhere, for it seemed unlikely that only one specimen would have been caught in one of the cataclysms of those ancient days. But, whether or not I was right, can never be told.

"Apparently the lizard was terrified at something; probably at the idea of being sucked into the chasm, into which the water was pouring, for it was making violent efforts to draw away from that end of the lake. It was a losing game, however, for the suck of the water, powerful as was the reptile, was too strong and, thresh the water as it might, and did, it was slowly being drawn back. Whatever else might be said of the lizard, it was no coward, for, realizing the fact that it was a losing game, it suddenly turned and, with a terrific bellow, using its flippers to accentuate its speed, in a sort of 'devil daring spurt,' it drove head-long into the vortex.

"During the day the waters continued to enlarge the chasm and, by night the lake had nearly vanished, as had also the reservoir.

"The following morning the city engineers were out, and as well as I could, I explained what had happened. As it chanced, I did most of my talking to the man who had supervised the construction of the reservoir, and was therefore the only one who knew about the nitro-glycerine. I realized that my knowledge of its presence in the pit caused him some worry, and he explained that he had given orders for its removal, but they evidently had been forgotten or disregarded by the workmen, so I told him I would not mention the matter to anyone, for which he seemed very grateful. Since it could have done no good to tell about it then, I deemed it best to forget about the matter.

"But I mentioned the lizard to no one. I explained the disappearance of Wilson, by telling them that he had fallen into the lake, from a rowboat, while trying to drive back to the shore a cow that had gone into the water. That also was the story I told the lawyers who settled up the estate.

"As soon as possible I gathered up my traps and came back to the city. I have tried to forget the experience, for it was far from pleasant, but this story in the paper brought it up again and, I repeat, I shall not be surprised to read that those men have found some hold-over from the mesozoic era, for I believe there are specimens still alive. Why not?

THE END

The MASTER KEY

by Charles S. Wolfe

"A master key for a bolt," Fenner said quietly. "A nice little electro magnet and some lamp cord. Simple, wasn't it. Hook right into the lamp socket and shoot the bolts about at will."

I FOLLOWED Fenner through the door of Davidson's office. We found the worthy Chief of Police seated behind his desk, from which vantage point he greeted us with an unusually cheerful "good morning."

He seemed in rare good humor, and I noted the quizzical uplifting of Fenner's eyebrows as he advanced to the desk and leaned lazily against it.

"We received your message, Chief," drawled Fenner, "and we came right down. What have we now —murder, mayhem, larceny or abduction?"

Davidson laughed outright. Involuntarily I started. It was the first time that I had heard a laugh out of the usually taciturn chief. In fact, I firmly believed that the very farthest he would ever get in that direction would be a broad grin. And I realized that something unusually humorous must have come up to betray the police head into open mirth.

THE cleverness of this story like the cleverness of a great many things lies largely in its simplicity. The shooting of bolts whether for opening or closing a door involves an impenetrable mystery until it is elucidated by so simple a solution that we must wonder it did not occur to everybody on the first reading of the story. Read the story and see what the Master Key was, and see how surprised you will be at the simplicity of it all. You will even find a Mr. Watson in this story—not the one of Sherlock Holmes fame however.

"None of the bunch you so glibly named, Joe," chuckled Davidson, "in fact, we have nothing. Everything is going nicely. I don't need you at all. But I've got a bird in my private office there who needs you badly. I'll say he does. Oh, boy! Wait till you hear his story!"

"Sounds interesting," admitted Fenner. "What is it? Usually obedient daughter eloped with the family chauffeur—something of that sort?"

Davidson rose. "Come on into the office and let him tell you the story himself," he said over his shoulder, as he led the way; and with curiosity aroused we followed after him into the next room.

Seated at the table was a well dressed young man whose face bore no trace of the mirth that seemed to have gotten the best of Davidson. As we entered, he glanced up quickly, and I imagined I saw the shadow of disappointment cross his features as Davidson introduced Fenner.

"Meet Mr. Fenner and his friend," said Davidson. "Joe, this is Mr. Watson, son of John Watson, who has the ice plant. Fenner here, Mr. Watson, is the man I think you want. Tell him your story. You'll excuse me, for I'm rather busy this morning."

Davidson left us, and as we seated ourselves across the table from Watson, I began studying him covertly, for he was a well-known figure around our town. Son of one of the wealthiest of our citizens, he was prominent in all the big social activities of the "upper set," and a member of all the exclusive clubs. His name was constantly appearing in the public prints, and I made the most of this opportunity to get a line on the man.

He spoke in low, cultured tones, not looking directly at us, and toying with a paper knife in a nervous fashion as he talked.

"I find myself in a most embarrassing situation, Mr. Fenner," he said, "and Davidson tells me that he is unable to give me any assistance, because the matter cannot be considered as legitimately in his line. I suppose he's right. Also, I admit that I am showing poor sportsmanship in asking aid in this business, but you will understand that it is not the money involved that leads me to unfair play. I am in a fair way to become the laughing stock of the city, and at all costs this must be prevented."

"And what is the difficulty, Mr. Watson?" Fenner asked politely, as the clubman paused.

"It is a silly bet that I was foolish enough to make at the Lynx Club with young Fair yesterday afternoon. We were discussing some of the popular books of the day, and finally worked around to a detective story which is having quite a run. Maybe you've read the thing—chap is murdered in a room to which there is no apparent ingress possible without detection—that sort of stuff. I remarked that all this kind of business was drivel—that in everyday life such things could not, and did not, take place. Young Fair, with all the romanticism of youth, defended the writer and his clan. Said that things occur in reality that outdo the marvelous happenings of fiction. The dispute grew rather hotter than either of us liked, and—well, we ended in a bet.

"Fair offered to bet me five thousand dollars that he personally could demonstrate to a selected committee that the mysterious entrance or exit from a room as described in this book was quite possible. I accepted the wager.

"The committee was selected, and the conditions agreed on. He was to enter a room from which no unaided exit could apparently be made. He was to be allowed the entire night in which to effect his escape. If he succeeded, I agreed to find him within 48 hours, and to explain how he got away or forfeit the wager.

"The arrangements were made, and he entered the chosen room at eight last evening. This morning we forced an entrance to that room. He has disappeared!"

Fenner made no effort to conceal his grin. "Put one over, eh? Any idea how he managed it?"

"Not the slightest," confessed Watson, dejectedly. "Apparently it is impossible. Yet he is gone. My forty-eight hours are slipping away rapidly, and it seems as if I am slated to lose. I don't regard the money at all, you will understand. I would give the little devil that much if he asked for it. It is the idea of having the young jackanapod hoodwink me in this fashion that makes me determined to find him if I can. Yet I haven't any idea where to begin. Now I am making you this offer. Solve this riddle for me, and the money I win you may have. Of course, I rely on you to keep secret the fact that you aided me."

"That's a pretty stiff condition," objected Fenner, "for how I am to get a look at the scene of this mysterious disappearance without someone noting my presence there, and how I am to trace the movements of Fair without following any trail he may have left without seeing it, is more than I can imagine."

"That you can easily do," returned Watson. "The selected room was in the Commercial House. This morning we forced the door, doing some little damage. I told the proprietor that I would send workmen around to make the necessary repairs. You may represent yourselves as locksmiths without arousing any suspicion."

"Right," Fenner agreed, cheerfully, "and now, Mr. Watson, give me a concise account of Fair's last movements."

"We finally chose a room on the twelfth floor. Fair accepted this room without comment, and it suited me. It opens into a long corridor, which leads to the elevator. It is much like the other rooms on that floor. The reason that it appealed to me was that it was situated quite a distance from the fire-escape. In fact, it is inconceivable that Fair passed out through the windows of the rooms."

"Granting that he had nerve to venture out over the abyss, couldn't he reach the roof?" queried Fenner, quietly.

Watson shook his head in negation. "Three stories above, is the out-jutting cornice, you know. Practically no hand or foothold on the surface of the wall. I don't imagine a cat could make it. I think we can eliminate the windows. The hotel proprietor assures me that there are no secret passages, spaces between the walls or anything of that sort in the building. I take his word for it. Now as to the doors. There are two. The one leading into the room from the corridor by which Fair entered, and one within the room in the left wall, leading into an adjoining room, which also has a door opening into the corridor.

"Both these doors have ordinary locks, not dead latches. For this reason, I suppose, they have also bolts. There is a bolt on the inside of the door which opens on the corridor, and a bolt on the door within the room. There is a bolt on the other side of that door, by the way, within the adjoining room. I looked this morning. And for the occasion, we put a bolt on the outside of the corridor door.

"When Fair entered the room we shot this outside bolt. He shot the one on the inside. That's why we had to force our way in this morning. That bolt on the inside was still in place. So also were both bolts on the other door. And there you are."

Fenner arose. "Your description of the conditions is good, Mr. Watson," he said, "and now Bill and I will become locksmiths and go down and see if we can do anything for you. If I am able to help you out, I'll call Davidson on the 'phone."

"Do that," agreed Watson, "and remember, the money is all yours if you can successfully unravel this mystery."

Fenner nodded, and we passed out, leaving Watson seated at the table. As we passed through the outer office, Davidson favored us with a wink and a grimace to which Fenner replied by forming with his hands a very creditable imitation of the long ears of a mule.

We made our way to Fenner's house, attired ourselves in working clothes, took a few tools, and caught a downtown car. As we rode, I ventured to question Fenner, hoping that he might have a possible solution to the riddle. He proved non-committal.

"Wait, Bill," he said, "until we have had a first-hand look at the scene of this fourth-dimensional chap's activities. Let us form no theories until we know all that is to be known about the case."

"Watson's description was quite lucid," I replied, "and if things are just as he described them, the trick seems impossible to me. Fair couldn't have flown, you know."

"No matter how impossible it may seem," rejoined Fenner, "you are face to face with the fact that when they broke into the room this morning Fair was gone. That, I take it, is proof enough that it is quite possible. Here we are."

On stating our errand to the manager, we had no trouble in securing admission to the room, and the departing bell-hop left us alone in the room from which Fair had contrived to find an exit.

The damage to the door was trivial and Fenner set about making the few necessary repairs. "You search carefully, Bill," he said, as he applied himself to the task of replacing the torn off bolt and its keeper, "and make sure that our young friend is not here, disguised as a bed or a clothes tree."

Ignoring the banter, I did make a thorough examination of the room, having come to the conclusion on the way down that Fair might just possibly have remained in the room, avoiding detection by some clever expedient.

My efforts were fruitless, however, for a search convinced me that he could not possibly be in hiding within the room.

Conditions were just as described by Watson. There was no disorder or sign of unusual physical effort to suggest a possible answer to the enigma. A glance out of the window assured me that Watson had spoken the truth. Just to fancy a human being clinging to the surface of that wall at that height was sickening, and I felt convinced that Fair had not made the fire-escape. Yet the bolted doors seemed proof that he had not passed through either of them, for it is possible to lock a door after you, but hardly so to shoot a bolt inside of a closed door. Also the fact that there were bolts on the outside of each of these doors made it look like a rather difficult proposition for him to have opened them at all, let alone having bolted them behind him.

The ceiling, examined from the vantage point of a chair, was as fruitless of clues as the previously scrutinized floor.

"And now," said Fenner, after these details had been attended to, "we will take a leaf from Watson's book, and have a look at the adjoining room."

By means of an ordinary skeleton key we readily got into this chamber through the corridor door. I prepared myself for another thorough search, but Fenner stayed me, "No use, Bill," he said; "let's go."

Mystified, and a little rebellious, I followed him from the room, and we made our way to the street.

As we walked along, Fenner hummed softly under his breath.

"It wouldn't have done any harm to have taken a look around that room," I grumbled, "on the off chance. While he's not likely there, we might have made sure."

"Nor would it have done us any good. Ah! there's a telephone booth. Wait here until I get Davidson and kiss that five thousand good-bye."

"Are you giving it up?" I demanded, amazed and hurt. "Let's go back and have another try."

"Not on your life," said Fenner, grimly. "Lead us not into temptation. If I go back there I may be tempted to collect that money."

"You'll never collect it this way," I demurred.

"My boy, I don't want to collect it," retorted Fenner. "I don't need money that badly. Watson's a short sport, or he would have seen this thing through himself, and not asked to buy the brains which he apparently lacks. Fair, on the other hand, has proved himself the possessor of some real gray matter. Get me? I'm going to be something of a good sport myself and not give him away."

I laughed, shortly. "Give him away," I echoed. "I hardly think you will!"

Fenner stopped short in his tracks, nettled. "Say, you ass," he said, sharply, "you don't think I'm stumped, do you? Let me tell you something, fellow. I know where that lad is at this very moment."

"You do?" I yelled. "Then where in blazes is he?"

"In that room that I wouldn't let you search, my boy," rejoined Fenner, complacently, gratified by my startled expression. "That's why I literally dragged you out. I didn't want you to flush the poor lad and spoil it for him. He was in that big closet, sticking out his forty-eight hours."

"He was?" I demanded, in amazement. "How did he get through that bolted door?"

"Easiest thing in the world," chuckled Fenner. "A cinch. He had the MASTER KEY."

"A master key for a bolt?" I demanded incredulously.

"A master key for a bolt," Fenner said quietly. *"A nice little electro-magnet and some lamp cord.* Simple, wasn't it. Hook right into the lamp socket and shoot the bolts about at will. He figured, and rightly enough, that the fact that all those bolts were found safely in their keepers would ward off all suspicion that he merely stepped into the adjoining room. He was right when he told Watson that things happen in every day life that are stranger than fiction. Maybe that worthy will believe him now."

"Good night!" I murmured, dazedly. "I never thought of that method—never suspected the trick."

"I did," replied Fenner, "and just the moment that I saw those bolts were of steel and not brass, I knew that I was right. Gee! Couldn't we have rigged up some station with those five thousand iron men!"

THE END

The RETURN OF THE MARTIANS

by Cecil B. White

A Sequel to "The Retreat to Mars"

I was suddenly bathed in a greenish glow and on the screen before me there appeared an image of my figure as seen from the front. Suddenly the chest of my protecting suit seemed to be sliced away in the figure, then the flash appeared. . . . Gradually the section plane cut deeper and deeper into my body until the lungs, heart and stomach were shown in section.

CHAPTER I

LITTLE did I dream, when I penned the account of Dr. Hargraves' epoch-making discovery under the title of "The Retreat to Mars," which appeared in the August issue of this publication, that even more astounding events were to take place within a few short months.

Soon after I had forwarded the narrative to the Editor, I received a telegram from Washington, signed by Hargraves, asking me to come at the earliest possible moment. Naturally, it was not long before I was on my way in response to his request, for I knew that my friend would not call me away from my work without good reasons. Moreover, my expenses were to be paid, and that appealed to my Scottish blood!

Hargraves met me at the depot on my arrival in Washington and whisked me away to his apartment at once. No mention, other than that it was something big, was made of the cause of his telegram, until I was comfortably settled in his study, after a good hot shower and a general clean-up necessitated by my journey.

When we were snugly ensconsed in front of a comfortable open fire, my host took a pile of foolscap and drawings from a side table, and laying them on his knee, he leaned back in his chair and began:

"I have here a translation of one of the volumes contained in the library and need the assistance of a psychologist and an astronomer to work out details of the apparatus described here and, afterwards, in the operation thereof. It is nothing less than a signaling apparatus with which we can get into communication with the Martians—that is, if they are still there," he added. "It is really a type of radio transmitter, but to me it appears to be totally new in principle. Knowing that you are a radio enthusiast and that you have done much work on the subject, I secured permission to get you to oversee the construction of the apparatus and assist me in getting in touch with the Martians. There are many men in Washington who would be glad to give an arm for the opportunity I offer you, but many of the secrets disclosed in the transcribed library are to become government property, and you will see, there are some that will be of inestimable value to the country holding them. For this reason, we prefer to call in one who has already proved himself trustworthy. If you accept the appointment and pledge yourself to secrecy, all the information that you need will be placed at your disposal. The necessary money for the experiment will be granted without demur, although we have made but the roughest estimate of the cost as yet. You will be granted a salary which, I think, will be satisfactory to you, while you are engaged in the work. Will you accept the appointment?"

"I should say I will accept!" I exclaimed. "It is no use my telling you how delighted I am that you should have given me this opportunity. There is a young chap just coming along and attending University who will be only too glad to carry on in my absence. I will get him to take over my share of the observing while I am away."

"We will settle things tomorrow, then," said Hargraves. "I will take you over to see the 'Chief,' who will make all the necessary arrangements. You can go over this translation and the diagrams, which I have had copied, this evening after dinner—it's nearly time for that now. Like to take a glance at the drawings before going in?"

I took the proffered papers and glanced at the diagrams. As Dr. Hargraves had intimated, the ideas were new to us. Though it would be classed as a radio transmitter, it was totally different to anything I had ever seen before. Gone were the familiar valves and oscillating circuits, they were replaced by purely mechanical methods of setting up the ether disturbances. The instrument was directional, sending out a beam that deviated from parallelism by an extremely small amount, hence the output of the arrangement was conserved, necessitating but a minute fraction of the power that would be required to operate even the most efficient of our beam transmitters.

During dinner we discussed the probability of our signals being heard. According to Hargraves, the Martians had erected permanent receivers at various points on the planet, connected with an alarm and recording system, so that as soon as the Earth replied to the long-delayed message, the inhabitants of the other planet would know that we had at last found their gift to us. They had promised that the receivers would remain in place and in order, as long as there was the slightest chance that the Earth would reply.

At the conclusion of the meal, we again repaired to the doctor's study and there I read the instructions for making the receiver and the transmitter. With all the facilities that were to be placed at my disposal, I knew that it would not be long before the first signal would be directed towards its goal. I could not understand the fundamental principles on which the operation of the apparatus was based, but from references given in the text I learned that I would find them elucidated in another volume; Hargraves promised to have this translated for me immediately.

THOSE of our readers who have read "The Retreat to Mars" will be interested in the present story, which is a sequel thereto. Mr. White, the author, who is an astronomer, is so well informed about this subject, that we read with bated breath, his most unusual, as well as powerfully written story. Many things are brought out here, which, very likely, the average reader never realizes, yet the story is not technical at all. On the contrary, it will hold the interest of practically every reader, no matter what his inclinations may be.

The following morning I was introduced to Dr. Smythe, the head of the department under which I was to work, and arrangements were quickly made that were satisfactory to all concerned. With three assistants I set to work without losing any time and in a few days the instruments were well under way. The work was carefully apportioned among the three men so that no clue as to the exact nature of the apparatus they were constructing could be obtained by any one of them, and the secrets of the instruments could not leak out. As it came to me, part by part, I carefully checked them over from the original specifications and assembled them into the components of the finished transmitter. Gradually I began to understand the exact nature of the power used, and as I studied the works referred to in the text of the instructions, I learned how to adjust and operate the apparatus when in operation.

As soon as the transmitter was completely assembled, Hargraves and I left Washington for the west coast, where my observatory is located, to install, test and adjust it. A powerful telescope was needed to direct the beam of the transmitter to the far distant receivers, and the necessary instructions for its construction and its operation were given. We had advanced more than far enough to take care of this part of the work ourselves, so these instructions were only read in a cursory manner, though they contained several new and far-reaching ideas that would repay later study. It was unnecessary to construct an instrument specially for this work, as the one I owned in my observatory was powerful enough, and, with the slight modifications we were able to make, we could use it in conjunction with the transmitter. The receiver lacked a few minor parts when we left Washington, and these were to be forwarded to us as soon as they were finished.

The projector was connected to the telescope in due course, all other work being suspended, and was adjusted so that the axis of projection was parallel to the optical axis of the telescope. This adjustment was very delicate for, as I mentioned before, the beam was practically non-divergent and, as the area it would cover on the planet's surface would subtend a solid angle of but four seconds of arc, the greatest care had to be taken in making this adjustment. We had also to ascertain the effects of flexure of the telescope tube in different positions and to make a table of the necessary corrections to be applied to eliminate this error in setting.

Through some misunderstanding, the parts for the receiver had not arrived by the time we were ready to make our first attempt to communicate with Mars. Nevertheless, we decided to make an attempt at letting our neighbors know that we were at last ready to communicate with them.

Anxiously we watched the sky the afternoon before the actual test took place, but it was cloudless and there was every indication of a good night. I checked up my computations carefully, so that I was sure that there were no mistakes in the position of the points to which the telescope had to be directed in order that the signals might reach the Martian receivers. It was necessary, of course, to direct the beam to a point where the receiver would be when the signals reached the planet—the velocity of the radio waves being finite. Three factors had to be taken into consideration on directing the beam. The first was that the planet was not where we observed it to be for, due to the finite velocity of light, the planet was somewhat ahead of the point where it was observed, the amount depending upon the relative positions and distances of the Earth and Mars in their orbits; then again the time that the signals would take to reach the planet had to be taken into consideration. The second correction was due to the refraction a beam of light suffers on entering our atmosphere except when coming vertically downward, this phenomenon making an object appear higher in the heavens than it really is. The third factor has already been mentioned, that due to the flexure of the telescope tube.

Two o'clock found the planet high enough in the southeast to warrant the attempt. The seeing was fair and with a power of six-hundred it was not difficult to set on the computed position. Hargraves pressed a key of the twelve-keyed keyboard used and a single long dash was sent on its way, hurtling with the speed of light towards its goal, 82,000,000 miles away.

The Martian code is difficult to describe without entering into it fully. It was sent with the aid of twelve keys, each key altering the characteristic form of the "carrier-wave." The keys could be pressed in combinations, with the result that a competent operator could send a message almost as fast as speech. Hargraves had become quite an adept with it and I had made a little progress, but not enough to transmit well. That was left to my companion.

Following a series of calling dashes, Hargraves sent off the following communication:

"We have discovered the library that was left by your pioneers after their attempt to colonize this planet had failed and, according to the instructions left for the discoverers, we are attempting to establish communication with you. Do not reply to this message, because our receiver has not yet been installed. We will inform you when we are ready. We are now going to repeat the signals to another receiving station in case this is not heard. We are transmitting from a point on the Earth which coordinates 78.856 and 19.440 N."

The coordinates that Hargraves gave in his message were obtained from one of the Martian maps made during their stay on this planet. It must be remembered that any translation that can be made from the Martian language into our own, must, of necessity, be decidedly free. The two languages have nothing in common, only the thought-forms can be given. For this reason, the above is but a free translation of the messages sent hurtling through space to the planet of mystery at the rate of 186,000 miles per second.

The call signal was repeated four times, and four times the same message was sent out that night, each time to a different receiver, in the hope that one of them, at least, would reach its destination. We would have to wait until the remainder of our receiver arrived before we could learn if we had been successful or not.

Four days later the receiver was completed and was rapidly installed, but much to our chagrin the night was cloudy and never once did we catch a glimpse of the planet, although the telescope was kept pointed to it throughout the night and the eyepiece was never left for an instant when there was the slightest chance of catching a glimpse of it.

The following night was more favorable, and we were able to see the planet long enough at a time to allow a setting to be made on the computed position and to send our call out once more, this time followed by a short announcement to the effect that we were ready to receive.

For fifteen minutes, in which time a returning signal should have reached us, we waited anxiously. Minute by minute passed without a single sound emanating from the receiver phones, with which we were both equipped. Our attempt, we thought, had failed. Again we tried, and for a few minutes, the clouds parted long enough for us to train the beam on a second station. Again we waited anxiously, but no reply was heard. Clouds prevented us from making another attempt that night, and with the dawn we closed up, filled with disappointment.

I awoke about eleven o'clock to hear Hargraves calling me. He entered at my answer and in his hand he held a copy of a late edition of the morning paper.

"Look at this," he said, pointing to one of the front page column heads. This is what I read:

RADIO EXPERIMENTER CLAIMS TO HAVE HEARD MESSAGE FROM MARS

Calgary, Alta.—Robert Eastwood, a radio experimenter of this city, claims to have heard signals last night which he believes to have come from an extra-terrestrial source. The signals, Mr. Eastwood states, were extremely faint and were heard when he was measuring static intensity at different wave-lengths. The amplifier consisted of six stages of audio frequency, preceded by a very sensitive detector of his own invention. The signals were likened to the whistle heard in a regenerative receiver and, as his detector cannot oscillate, they could not be due to that cause. They were badly distorted by the high amplification used.

It seems most likely that these were the harmonics of some commercial transmitter rather than what Mr. Eastwood claims them to be, though he is most emphatic in his denial of this possibility.

"Have I made a mistake in the position of the receiver that I gave them?" I exclaimed, jumping out of bed and hurrying to the den in my dressing gown. "No," I replied to my own question, "there has been no mistake. I wonder if those signals were meant for us."

"A very strange coincidence if they were not," replied my companion. "Can the Martians have made a mistake in our position or an error in their direction?"

"Hardly likely," I exclaimed. "Wait a minute, though, I have an idea." Going to the telephone I called the meteorological observatory, the director of which is a friend of mine, and asked for a report on the general cloudiness of the night before. The reply was what I expected—Clouds covered the northwestern States and western Canada as far east as the Great Lakes; the general conditions over the western hemisphere, north of the tropics, were cloudy. Evidently the Martians could not get their bearings well enough to direct their beam to the correct position for it must be remembered that we were on the unilluminated side of the Earth. Eastwood had heard the signals intended for us, we thought.

The cloudy spell broke that afternoon, leaving us with a clear sky. Full of expectation, we sent our signals out once more as soon as the planet was in position. Twenty minutes after our first call, the headphones, with which we were both equipped, clattered violently, causing us to remove them. Reducing the intensity, we replaced them and Hargraves commenced to put into shorthand, the message that roared through.

"Train upon the Elysium receiver," commanded my companion, after the phones had ceased sounding. I rapidly computed the new setting point and directed the telescope thereon.

At my "All set," another message was sent out. Guiding the telescope, as I was, I had no idea of what was going out or coming in. I would have to wait until we were all through before I could learn the context of the messages.

It was the biggest thrill I had ever experienced as I sat back there on the observing ladder, with my eyes glued to the binocular eyepiece and my fingers on the slow motion controls with which I corrected the slight irregularities of the driving clock. Now and then the image would be blurred by a wave of poor seeing, and I would strain to hold the cross wires on the point on which I was guiding, my landmarks having disappeared in the general blur.

Two hours were taken up in this way, without a break other than was necessary to turn the dome or shift the ladder, as the rotation of the Earth carried the planet across the sky. Eventually Hargraves made the cryptic remark, "Well, that's that! All through, old man. Come and get some coffee and have a smoke; you need it. I'll read this out to you."

I was glad of the respite, for the strain had been great and my eyes and head ached with the intensity of my efforts.

CHAPTER II

IT would take up too much space in this account to repeat the messages sent and received, word for word. The reader who wishes to read the exact messages will find them published in the special bulletin issued by my observatory.

Our first message was to the effect that we had attempted to communicate with them the preceding night and were now ready to receive. Then we reported that signals had been heard by an experimenter in another locality, some three hundred miles away, and inquired if these emanated from their transmitter. At this we stood by for the return message, which, as you know, nearly deafened us with its intensity. The message ran as follows:

"Congratulations. We were expecting the library to be found about this time. Our observations showed that it was still where we left it. We heard all your signals; they were quite strong and well directed. It is unfortunate that you did not hear us last night; the error was ours. Conditions at our transmitting station were none too good, and this, combined with the masking of the lights of your cities by dense clouds, caused an error to be made. You were evidently just outside the beam. Tell us how the discovery of the library came about. Now transmit to us for 0.0049 day*—during this interval we will transmit to you, then stop to receive the message, which will take that time to reach you. In this way no time will be lost."

Following the receipt of this message, Hargraves sent to our Martians an account of his deductions and the resulting discovery of the library. A few moments after his conclusion, the phones sounded again and a communication of about seven minutes' duration was received. This was followed by others at intervals of the same length. My companion's messages were accounts of the progress of civilization on this planet and need not be recorded here. The following is an abstract of those received:

Shortly after the *Retreat to Mars,* another unforeseen catastrophe overtook the Martians. The survivors of the expedition, unknown to them, carried the seed of death back to the parent planet. All known diseases had long since been eradicated from

*The decimal amounts to nearly seven minutes. The Martians, being unaware of our system of measuring time were compelled to adopt this method of conveying the time interval to us. This system is used a great deal in astronomical work for, as will be seen, it facilitates computation considerably.

the planet Mars, but the returning pioneers carried with them a new and more malignant enemy than had heretofore been encountered. This did not attack those who carried it back with them, as their special physique and the acclimatization to which they had been subjected, had rendered them immune to it, even though they were carriers. Within a year of the return of the survivors, the wonderful system of the Martians was sadly disorganized; over half the population were dead or dying from the awful plague which swept over the planet like a scourge. Despite their knowledge of bacteriology and medicine, the plague continued unchecked until no more than one hundred and fifty of the original millions of the planet's teeming population were left alive. All these were survivors of that ill-fated expedition to the Earth.

A stupendous task confronted the survivors. Men of their calibre could not stand by and see all that they had gained lost without a struggle. To the everlasting credit of those heroes of the past, let it be said that the loss was small and the Martians of today have them to thank for the advanced position they hold. Picture, if you will, the problem before them. The survivors, few of whom were scientists, as they understood the term, had to set to work to educate their offspring and to inoculate them with the high ideals held by the vanished Martian community. The sciences which were first stressed were those of fundamental importance to the economic life of the race. They included biology, chemistry and engineering in all its branches, all the applied sciences which were vital to the perpetuation of the race.

It must be remembered that the planet was fast losing its water supply and that the first thing to do was to continue the operation of the vast works already constructed to conserve the planet's vital fluid. Truly a tremendous task for so few.

A century later saw the planet's population increased to a little over twenty thousand inhabitants. These were divided into district groups, each group being responsible for the upkeep of all the state machinery within its borders—a tremendous task, for much of the apparatus and plants had suffered from neglect during the early part of the century. Thanks to the alloy—which we have called arenium—that was used in its construction, corrosion and oxidation did not affect the pumping machinery of the water conservation system; in many places, though, neglect had played its part in rendering inoperative many of the great public power plants.

The social system, that had been developed before the cataclysm, held steadfast throughout the greatest trials that any system could be subjected to, and never once did it waver throughout the darkest times the planet ever knew. It must be said, however, that the survivors and their descendants continued with the desperate remedy instituted long before, of eliminating all who would or could not work under their system, thus saving the unity of the whole at the expense of a few.

Under these adverse conditions, it is not to be wondered at that the Martians made no progress. Until they discovered how to conquer the subtle disease that ever threatened them, little advance was made in any of the sciences except bacteriology and medicine. Eventually, the corps of workers who were continually engaged with the problem discovered the means of eradicating the loathsome disease, which was akin to leprosy. From that time their advance had been slow but steady.

It will be of interest to my readers, I think, to record here the report we received on the reception of our first signals. The first receiver we had trained on was one located in the Solis Lacus region, the time there would correspond to about 2 P. M. here. This particular receiver was located in an observatory and the quiet of the afternoon had been broken by the mellow sound of the alarm, followed a few moments later by a second. Immediately the members of the observatory staff were in a state of suppressed excitement; the Earth had awakened from her long lethargy. Connections were at once made to all the public annunciators and before the message came through, the whole of the planet knew that the Earth was in communication with them at last. The direction indicators that were at once applied, gave them the position of our transmitter. They recognized that the signals were coming from a building they had always suspected of being an observatory. A few minutes later the second receiver, the one in the region we call Arcadia, sounded its alarm and the second message—a repetition of the first, was received.

I was somewhat surprised at the fact that the Martians admitted showing excitement at the receipt of our signals, for I had thought that the emotions would have become practically non-existent with the high development of the Martians. We learned later that they had wisely preserved these emotions, some being developed even. Had this not been the case they would have become machine-like automatons and this state was looked upon by them with horror; only the undesirable had been eliminated.

On the conclusion of our inter-communication, they asked us to call them the following night as there was an important problem under discussion and they expected to give us some interesting information.

CHAPTER III

THE following night the sky cleared about eleven o'clock, much to our relief, and remained clear throughout the rest of the night. Fifteen minutes after our calling signal had been sent out, the answer arrived. As the message came through, I heard Hargraves exclaim, "Good Lord!" and then relapse into silence. Imagine my curiosity! The message ceased and Hargraves turned to me with the question, "How would you like a trip to Mars?"

"Are you joking?" I asked in amazement. "No, I am not," he replied. "The opportunity is offered to us. Do you accept?"

"Of course I accept," I answered at once. "How is the journey to be made?"

"I'll tell you later, if you are sure you want to go. We can take two others along with us. I am going." With that he turned to the keyboard and sent a short message.

In a few minutes the Martian signals commenced again, and continued for the space of perhaps thirty minutes. When they ceased, my companion said, much to my surprise, "That is all for this time."

"What is wrong?" I asked, for we had arranged to ask quite a number of questions in the hope of solving some of our individual problems. "You

haven't actually sent out all that stuff, have you?"

"No need to," was his reply. "We are going there to find things out first hand."

"When?" I asked.

"In about fifteen days," Hargraves informed me. "Listen to this." I sat on the steps of the observing ladder while he read the message he received. It ran as follows:

"Since receiving your first signal, we have been considering which would be the best method of learning all we can from you, as well as instructing you in all the things that we think will be of value to you. It has been decided that the best method will be for you to visit us during the coming conjunction of your planet. To this effect we will send you one of our space machines to bring you to this planet. As you probably know, we are not able to withstand the extra strain to which our bodies are subjected on the Earth, so that we are not able to stay for any length of time. Moreover, we do not wish to run the risk of bringing disease back to our planet again, so we believe it will be best for you to come here with our representatives in the machine that will be sent for you. You will understand, we feel sure, that it is necessary for us to safeguard the health of this planet above all things, hence you will not feel that you are subjected to indignities, if special precautions are taken for our protection.

"The constitution of the atmospheres of the two planets is nearly identical, so that you will suffer no inconveniences in that respect though the pressure will have to be increased for you. We will supply you with protective coverings in which the pressure can be kept suitable to your well-being. We would like to obtain as comprehensive a collection of your books on social, engineering and scientific subjects as possible. If you can obtain these for us, let us know." (Hargraves informed them that this could be done.)

"If you consent, the machine will leave here as soon as it is equipped and should arrive at its destination in fifteen days' time. We desire you to be prepared by then, as it is not advisable that our envoy stay on the Earth any length of time. If these arrangements are suitable for you, let us know. We will resume in five minutes."

When Mars is in opposition to the Earth, the Earth is in conjunction with the sun to observers on Mars.

At this juncture Hargraves sent the message signifying our assent to the Martian plans. During the interval that had to elapse until our message was received, the following came through:

"You may wonder whether we have visited the Earth throughout the ages that have passed since our first experience there. We have, several times, but we found the conditions not ripe for any attempt to communicate with you. Consternation and terror was manifested by those that saw us even one hundred years ago, our year being equal to 687 of your days, 669 of ours; since then, however, you have evidently made rapid progress. The rapidity of your recent advancement shows that your men of science, at least, are breaking away from the savage superstition that always surrounds a race in its development. You have learned, we believe, the great lesson that, because a thing or phenomenon is not understood, it is not necessary to call in unnatural or supernatural explanations to account for it."

Then came a brief pause followed by:

"Your acceptance of our offer has been received. It will be as well for you to prepare a store of provisions to last you at least fifty days, in case that the food which we can supply proves unsuitable for you. In case you have perishable supplies, we will provide methods of preserving them. Our machine will 'land' on the water of the landlocked bay due south of your observatory, unless you inform us that it is inadvisable. It will aid the pilot if you mark your position with a large white banner with a black circle upon it. Kindly be prepared to board the machine at once. Unless you have some important question to put to us, or information to give us, this will be the last time we will communicate with you, until we see you here on this planet. We will close this communication by wishing you an interesting and profitable voyage to this parent planet of yours."

"Well, old man, what do you think of that?" said Hargraves, as he concluded reading the messages.

"I don't know what to think of it," I replied. "It seems more like a dream than reality. I'll believe it to be true when the Martians arrive."

"I feel somewhat like that myself," said my companion. "It does seem too remarkable to be true. However, I guess we had better send a wire to Washington for those books, if they are to be here in time. We have plenty to do before we leave. Now, then, who are to be the other two that will accompany us?"

"I would like to take my wife along. I am sure she would like to go," I said. "We should take a member of the gentler sex along with us, anyhow, don't you think so?"

"Of course, she must come along with us," was Hargrave's comment. "Who else?"

"Nay. That is up to you," I replied. "I suppose that one of the Washington people should go. They made this thing possible."

"I think that I will leave it to Smythe to select the fourth member. I'll wire him right away," said Hargraves.

The following days kept us busily employed, for there were many preparations to be made. My wife had agreed to accompany us after only a moment's hesitation, and many of her suggestions were exceedingly useful to us. The books arrived from Washington with a day to spare. There were nine large crates of them. I wondered if there would be room for them all in the space flyer.

The fourth member of our party was Dr. Smythe himself. He decided to accompany us as soon as he read Hargrave's telegram. He had taken the greatest interest in Hargraves' work and read the Martian language as well as the discoverer of the library could. He would be an exceedingly useful member of the party.

CHAPTER IV

NATURALLY we were all on the *qui vive* on the day that the Martians were expected, and never before were the heavens watched with greater excitement. At about three o'clock, a dark speck was sighted in the blue which rapidly became larger, revealing it to be a machine—evidently the one we expected. After a long spiral glide, the machine struck the water in a cloud of

spray. It was traveling at a high rate of speed—about two hundred and fifty miles an hour, I judged—when it landed, and shot along to the dock, where we waited. We had marked our position, as we had been directed. Luckily, the dock, which belonged to a marine engineering firm, was deserted, for it was Saturday afternoon and the employees had left. Only the watchman was present, besides ourselves, as the space flyer swung alongside. The machine was about one hundred and twenty-five feet long, with a diameter of perhaps thirty feet. It was torpedo-shaped, with single wings, and a span of a good hundred feet formed the supporting surfaces when in the air. It had the familiar rudder and elevators, but it lacked any visible means of propulsion.

A large glazed port swung inwards as we pulled the machine to the dock, disclosing a figure which at first glance appeared to be clad in old-fashioned armor. He was a giant, fully nine feet tall and, if one could judge from his protecting armor, with a chest like a barrel. His head was enclosed in a transparent globe, which fitted into the neck-piece of his covering, permitting us to see the smile of greeting upon his rather handsome features. His forehead was broad and high, and his head was crowned with a mass of curly chestnut hair.

What the watchman thought, I do not know, but I heard a gasp and a "Lor' lumme!" from him. We had told no one of the intended visit.

As our little group approached the open port, the giant handed us a sheet of material upon which something was written. Hargraves read it and turned to us, saying, "Bring the baggage to the edge of the dock." With the aid of the watchman, we trundled the cases up to the machine on a hand truck that we had borrowed, and as each piece was brought up, a jointed arm, built up on the lazy tongs principle, shot out and clasped it, whisking it away into the interior of the machine. In a very short time all our effects were on board and we followed.

We found ourselves in a broad passageway traversing the craft, at the opposite end of which was a second glazed port similar to the one that now swung to behind us. The space was half full of the baggage that had come aboard. Leading aft was another smaller passage, and down this we were led by our guide. Four compartments opened off from this alley and we were directed into one of them. As we entered, there came a rushing sound and the machine began to plough slowly through the water. Through the broad glazed windows of the cabin we saw the dock slide by. The sound grew to a roar and the water slipped past us faster and faster, until our view was obscured by a dense cloud of spray. Suddenly the spray cleared and we saw the surface of the water dropping rapidly away from us. We were aloft and swinging northward at an enormous speed over the harbor.

The land dropped away and the topography of Vancouver Island unfolded itself below, its lakes appearing like little gems glittering in the sunlight. Northward we flew, ever climbing. Soon we could descry the smoke of Vancouver, lying like a pall over Burrard Inlet, and the Fraser River winding eastward into the distant hills. Ever climbing at a terrific rate, we sped over the mountains while the fjords of the coast appeared below us and the Queen Charlotte Islands rose out of the blue Pacific to the northwest.

So great was our pace, that the land, many miles below, could be seen swinging by like a panorama. We were up in the rare atmosphere and the roar of the driving jets, as I supposed it to be, gradually diminished in intensity with the lessening atmospheric pressure until presently it was but a faint murmur. Gradually, even this faint sound faded out as we passed beyond the limits of the earth's envelope and the familiar blue of the sky gave way to the blackness of interstellar space, studded with its brilliant suns.

The cabin was now brilliantly lighted by circular transluscent plates on the walls and ceiling, behind which the source of light was hidden. This illumination was now necessary, for the diffuse light which illuminates a room through its windows, when there is a considerable amount of air present, was now lacking, only a bright patch of sunlight appearing on the forward bulkhead of the cabin, which shed a faint light in the cabin.

I am afraid that the impression we had given our first Martian acquaintance was not very favorable, for, in the excitement and interest of leaving the Earth, we had neglected the elements of courtesy. This thought seemed to strike us all about the same time, for Hargraves turned and wrote a short sentence on one of the pads with which we had provided ourselves, and handed it to the Martian, who had remained seated since he ushered us into this cabin. After reading it, he took a small box from his belt where it hung, and connected a tube, leading from it to the lower part of his helmet. He then spoke for a few moments. The voice, though muffled by the casing, seemed soft and melodious. After he had spoken, he took a sheet of paper-like substance from the box, where it had gradually jerked into view as he spoke, and handed it to Hargraves.

"I apologized," said Hargraves to us, "for our rudeness in neglecting our host the way we did, and explained that the novelty of the situation was the cause. Our friend here understands how we feel about it. His note goes on to explain that the covering he wears is to protect him from the danger of contracting disease, as well as to protect his body from the pressure of the air in the space flyer, which will be kept at the barometric height we are accustomed to. We will be required to wear somewhat similar suits when we go into other parts of this craft. This portion is sealed off and assigned to our use; there are two sleeping chambers opposite and the cabin is next to this. He will now see about storing our food supplies, if one of us will go with him. By the way, this is the commander of the craft."

My wife and I retired with the skipper after Hargraves had "introduced" us. In the next cabin were several large receptacles built into the wall and fitted with devices to prevent their contents from moving. These were the refrigerators which had been promised us. They were kept at a low temperature by the mixture of chemicals, which absorbed heat on uniting—an endothermic reaction. Arrangements were also supplied for heating and cooking, again of a chemical nature; this time the admixture which gave out heat—an exothermic reaction. Two common examples of these reactions are: The heating of a mixture of unslaked lime and water, which is exothermic, and the cooling of a mixture of sodium hyposulphite (the photographers' "hypo") and water—endothermic. We spent the better part of

an hour transferring our food supplies to the food chests. Eventually we finished and at once repaired to the observation windows of the main cabin.

Dr. Smythe asked the commander for information as to our speed and other details. We were now some five hundred miles above the Earth's surface and, as we could see, over the polar regions. Our speed was then about forty miles per second and was being gradually accelerated until we reached the final velocity of the order of ninety miles per second, which velocity would be retained until we got near to our destination. Our guide then offered to conduct us through the machine and let us meet the other members of the crew, which numbered four. On our acceptance of his offer, he showed us where our suits were stored, assisted us to don them and showed us how to adjust them so that they fitted comfortably.

These suits were much like divers' suits, which likeness was enhanced by the globular helmet which surmounted them. Following their adjustment, we were shown how to control the air filter and the pressure adjustments. We then followed our guide forward into a small chamber on the walls of which were several dials and indicators. This was an air lock, and here the pressure was reduced to that of the other compartments. The air was sterilized and our suits were sprayed. Truly the Martians were taking no chances, nor could we blame them, when we remembered the billions of bacilli that were in our system or lurked in our clothing.

After the lapse of a couple of minutes, a second door was opened and we entered a large room about thirty feet long and the full width of the machine. In the center of it a cylinder, about seven feet high and five feet in diameter, rose up through an opening in the floor. From its top led two large pipes, one passing forward and the other aft. A gentle heat radiated from them. On the forward wall of this cabin, on either side of a central door, were a number of valves and gauges, or indicators of some kind. A second Martian came aft to meet us as we entered. He was heavily bandaged about the thighs and abdomen, but wore no other clothing or ornament. The flesh was brown as though from continual exposure to the sun; his head, like that of his commander, was crowned with curly chestnut hair. He walked with apparent difficulty, to where we stood, with a smile of welcome upon his features; then, turning to his superior, who was relieving himself of his armor, took the automatic writer from him and dictated into the mouthpiece for a few moments; then held out the sheet. Dr. Smythe took it and read aloud for our benefit. It contained a word of welcome and an invitation for us to avail ourselves of the opportunity of having the mechanism of the craft explained. This was accepted with alacrity and the second giant then took us in charge.

This compartment, and the one directly below it, contained the power plant of the space flyer. The central cylinder was the mixing chamber in which the chemical fuel of the craft was forced by injectors. The fuel was in the solid form and was pulverized before going to the injectors. On admixture, it exploded spontaneously and the resulting gases were led forward and aft by the two pipes we saw. The pipes divided into four, each branch supplying a nozzle outside the hull of the craft. These nozzles could be turned and thus the machine was guided when in space—the jets of incandescent gas propelling the machine as a rocket is propelled aloft. The tubes and combustion chamber were covered with insulating jackets to prevent undue loss of heat—heat being synonymous with energy in a heat engine. The pressure in the combustion chamber was of the order of fifteen hundred atmospheres or about twenty-two thousand pounds to the square inch; the temperature being 4,200 degrees absolute, which by subtraction of 273 gives the Centigrade temperature of 3,927 degrees.

The first Martian now joined us, attired in the manner of his companion. This attire was to support their inner organs under the greater strain to which they were subjected on or near the Earth. We were now led through the central door in the bulkhead to the foremost compartment—the control cabin. Here we saw the third member of the crew, of the same fine type as the others, but with slightly darker complexion. He was seated in a comfortable padded chair and his eyes were at the eyepieces of what appeared to be the eye-end of a telescope, as indeed it proved to be. The rounded, transparent nose of the craft gave the pilot a clear view of the heavens ahead of him. Above the control cabin, we were told, there was the objective of a huge refracting telescope. When passing through the atmosphere, a streamline hood swung over this. That accounts for our not having seen it. The focal length of the lens, which was over eight feet in diameter, was about one hundred and twenty feet. Sixty feet away, over our apartment, was a plane mirror which reflected the converging beam back again to a point just ahead of the pilot, where another mirror reflected the beam down to the eyepieces. This huge instrument was necessary in order that the pilot might avoid any small bodies in space, for, with a velocity of such amounts as those we were attaining, it was necessary to see a body at least three hundred miles ahead in order to avoid it. Bodies too small to be seen with the power used were too small to damage the craft. Several times during our journey across the gulf we saw brilliant flashes of light on the transparent nose-cap, due to the impact of small particles of matter. This nose-cap was made of one of the toughest and hardest substances known to the Martians, so hard that it was worked only with the greatest difficulty. Objects to be made of it were usually cast into shape, to avoid machining. The components of the great lens over our heads were made of the same material, though of different densities, in order that the lens might be achromatic.

In front of the pilot was a semi-circular dashboard, on which the various instruments of navigation were mounted. These were pointed out and described to us. An air speed indicator, automatically corrected for varying densities of the atmosphere through which the machine might fly; pressure gauges indicating the pressure in the combustion chamber and the atmospheric pressure; a flow indicator that showed the rate at which the propelling gases left the nozzles, while other instruments supplied the other data that were needed by the pilot in the operation of his craft, such as total-run meter and space-speed indicator. This latter aroused my curiosity. How, I asked, could the velocity of the machine be measured in space? The method was explained to me and the theory of it proved to be quite simple. One of two periscope-like arrange-

ments projected an image of the sun upon the slit of a spectroscope of very high resolving power. One of the sharpest and strongest spectral lines formed by the instrument fell upon two fine sensitive wires. If the line shifted one way or the other, the extra heating effect upon one of the wires caused a flow of electricity to pass through it, which, by an arrangement somewhat like the "Wheatstone bridge," automatically recentered them. The wires were connected to an indicator. As the space flyer approached or receded from the sun, the spectral lines shifted toward the violet or red respectively—the well-known Doppler-Fizeau effect—thus indicating the velocity of the machine with respect to the sun. Knowing the angle between the path of the machine and the line joining the machine and the sun, the true velocity was easily found by an elementary trigonometric computation, which was automatically performed.

On returning to our own quarters we were shown how to operate the air lock so that we could come and go at will. My wife had gone to them some time before and, as we entered, we were pleasantly surprised to find the swinging table spread with a hearty supper. I suddenly realized that I was hungry, and on looking at my watch, was surprised to find that it was after eight o'clock, P.S.T. We had been on our way for five hours. The Earth now appeared as a huge silver crescent with a smaller one, the moon, to the right of and beyond it.

The meal finished, we returned to the pilot cabin to find the fourth and last member of the controls and the Martian he had relieved talking to him. Here we remained, learning more about the strange craft and its operation. The air supply, we learned, was replenished with oxygen and the carbon dioxide removed while the air passed through the filters, which it did every five minutes, as this system was continually in operation. For landing, the hull of the craft was flattened below and stepped like that of a hydroplane; it was also equipped with wheels that disappeared into recesses in the hull, much like our earthly "amphibians."

When we retired, a gulf of half-a-million miles had widened between us and the earth, which now appeared as a crescent twice the size the moon presents as seen from the earth. Cynthia herself was visible, now but a third of her familiar self, beyond and to the right of her big sister. The sun appeared to the left—a flaming orb with a single scarlet prominence at least a quarter-of-a-million miles in height on the western limb.

To complete a rather sketchy description of this, our temporary home, I must mention the arrangement of the sleeping quarters. The beds, couches or berths, which ever you want to call them, were slung in a frame in such a manner as to always remain horizontal; below them were cupboards, in which we could keep our meagre personal effects. The machine had been gradually assuming a tilt upwards towards the bow, until we now had to use the hand-rails, when we moved about the craft. We were rapidly losing weight, too; all our movements were being made with the greatest ease.

CHAPTER V

THE following day, according to our reckoning, found us nearly two million miles on our way. I was caught unawares on awaking, much to my wife's amusement, for I sat up suddenly in bed as is my wont, only to precipitate myself from the bed until I came into contact with what had been the forward bulkhead, but which now appeared to be the ceiling. It took us some little time to get used to this new state of affairs, and many amusing little incidents took place before we became accustomed to the rapidly vanishing effects of gravity.

Day after day went by uneventfully, and during this time Hargraves and Smythe set to work to master the spoken language of the Martians, which proved an easy task to them. My wife and I also set ourselves the same task and worked at it steadily so that before we arrived at our destination we could make ourselves understood. The language of the Martians is as logical as a language can be; there are no confusing "exceptions" and the verbs are as simple to master, as are the written ones that I described in my first account.

We spent most of our time in the control cabin as we neared our destination and watched the surface features of the ruddy planet unfold as its distance decreased. One afternoon I caught a glimpse of a canal like a spider web on the planet's surface, then another and another until the surface was seen to be covered with an intricate network of them.

On the day before our arrival, we were startled to see brilliant jets of flame shoot ahead of us. They were from the retarding nozzles which the pilot had opened. Almost at once the bow of the machine became its floor. For the past few days there had been no up or down to us; now, with our negative acceleration, the direction in which the craft was pointing became our nadir.

In spite of our suppressed excitement, we slept well and awoke on the eleventh day to find the planet a huge disk slightly to one side of our path. The flow of the jets was increased from time to time as we neared our goal. Our pilot was reducing our speed and directing the craft so that it would strike the upper layers of the atmosphere tangentially with the velocity that would carry the machine round the planet like another satellite in a circular orbit, if all power were cut off.

As we neared the planet, its features became more and more resolved, and I was intensely interested in noting the development of details, which I had observed from the Earth as only the most vaguely defined spots or blurs.

We struck the outpost of the atmosphere over the northern point of the Syrtis Major, the great "Hour Glass Sea," which Huygens had drawn three hundred years ago. Eastward we swept, ever nearing the planet's surface until, when over the region we call Elyseum, the Trivium Charontis, a veritable junction of canals, appeared on the horizon.

The Lucus Triviae of the Trivium was our objective and over this we glided in a great spiral, the "oasis" becoming a tessalated region, centered by a vast city beneath our feet. In a couple of minutes we were skimming the roofs of that city; then, as a vast pile loomed ahead of us, there was a slight jar and the machine was rolling along a smooth runway. We had landed on one of the galleries of a huge pyramidal building.

A port below the wings was opened as the machine came to rest and the commander of the expedition stepped out, beckoning us to follow. There were no crowds to meet us—only a single Martian came forward from a large doorway as we alighted. We

were handed over to this newcomer with the advice that we were to go to the official welcome. Led by the guide, we entered the doorway into a small chamber. On our entrance, he pressed one of a row of numbered switches and the chamber glided smoothly away. In a moment or two it stopped and we stepped out into a large, well-lighted room, whose windows looked out on one of the broad galleries encircling the building. The diminished sun was shining through the windows and in the rays of it sat a Martian who appeared to be older than any of the few we had met before. He was clad like those in the space machine after they had removed their supporting bandages after leaving the Earth.

As we entered, he arose and walked over to greet us, welcoming us on behalf of the people of Mars. At his request, we seated ourselves on the four chairs provided for us, in front of a circular plate of some substance that glittered with all the colors of the rainbow. This plate was set vertically in a panel of arenium and around it were arranged a set of reflectors of parabolic form with tiny coils of wire in their foci.

"I am now going to introduce you to the people of this planet," said our host. "This instrument transmits both the sound of the voice and an image of anything placed before it. In this way all may see and hear you. Tell me how you name yourselves on the earth."

Hargraves "did the honors," telling the Martian our occupations as well as our names, and finished by introducing himself. Dr. Smythe added that our presence on Mars was due to Hargraves, who discovered the library. At the conclusion of this ceremony our host pulled out a small knob that projected from the panel. The filaments in the reflectors at once glowed a dull red, and we felt ourselves bathed in a gentle heat through our helmets. Facing the screen, the Martian spoke. I reproduce as much as I can of his speech from Hargraves' account, for I missed most of it, not having been well enough advanced in the language to follow it well:

"Citizens of Mars," he began, "we are able, for the first time, to welcome to their parent planet, four of the descendants of that ill-fated expedition which left to colonize our Evening Star many ages ago. You will all join with me, I know, in making their stay, which must necessarily be short, as instructive as possible. At the conclusion of their visit, let us hope that they will return to their planet, which they call the earth, with the seeds of the great social system that we developed so long ago, and may those seeds fall on fertile ground, so that it will not be long before the divers races of the earth —for there are many, I am told—will become as one, working together for their common welfare and advancement.

"Our guests are: Dr. Smythe—the title 'Doctor' indicating that he has attained a high degree of learning in some special department of knowledge, in his case Archaeology; (Dr. Smythe had risen from his seat in acknowledgement of the introduction; we all did in turn.) Dr. Hargraves, another archaeologist and the discoverer of the records our ancestors left behind; Mr. Arnold, an astronomer who has made a special study of this world of ours and whose instruments so well directed the messages we received a short time ago; and lastly, Mrs. Arnold, the wife of the astronomer, who has the distinction of being the only woman member of the expedition.

"Each of our guests will now speak to you briefly, for they have gained some knowledge of our language on their journey here."

Our replies were short and to the point, expressing our gratitude to the Martian people for the great privilege that had been accorded us and echoing the hope that we should see the chaotic conditions of our social system give way to, and be replaced by, the perfect system that had been so well tried and proved on Mars. We acknowledged our great inferiority and hoped that they would be patient with us and that they would overlook our multitude of deficiencies. My wife concluded by presenting the planet with the store of books, which we had brought with the hope that their perusal would elucidate the difficulties which they must have in understanding such a complex system, or such complexity with a lack of system, as existed on the Earth.

At the conclusion of the simple ceremony, our host outlined the social system of the Martians to us:

As soon as the youth of Mars showed their natural inclinations, they were trained along those lines. On the completion of the training, they were appointed to a vacancy that was opened for them, there being no more prepared for a line of service than it was shown that the branch could absorb. Their advancement from this time on was gradual, until their period of service ended. The period of service varied with the responsibility of the office, the shortest being the term of those engaged in executive positions; the longer of those engaged in tasks which required but little effort. The grading of these tasks had been done scientifically, by actual measurement of the amount of energy expended in performing them. The product of the rate of energy expenditure and a time factor, which was logarithmic, gave a constant quantity for all positions from that of a simple machine operator to that of the President. In return for his labor, each member of the community was provided with the necessities of life, according to the needs of his family. A state credit was also given, which allowed him to indulge in the luxuries the planet afforded. So highly developed were the Martians that they did not need supervising; each man knew his duty and it was done to the best of his ability; no shirkers were present, nor had there been any for many ages. It must not be thought that it was fear of punishment that kept each man to his task, it was the knowledge that he was part of a smoothly working machine and that it was only by the co-ordination of the whole that he could live and enjoy the benefits the system gave him and his millions of companions. This wonderful system had developed from the necessity arising for the united efforts of the planet in the conservation of its water supply, as Lowell suspected and pointed out in his "Mars and Its Canals." Let me quote him:

"—Whether increasing common sense or increasing necessity was the spur that drove the Martians to this eminently sagacious state we cannot say, but it is certain that reached it they have, and equally certain that if they had not they must all die. When a planet has attained to the age of advancing decrepitude, and the remnant of its water supply resides simply in its polar caps, these can only be effectively tapped for the benefit of the

inhabitants when arctic and equatorial peoples are at one. Difference of policy on the question of the all-important water supply means nothing short of death. Isolated communities cannot there be sufficient unto themselves; they must combine to solidarity or perish."

The social and economic standing of every member of the community was the same. The birth rate of the planet was stabilized in order to keep the population well within the limiting number which the planet could support, two to three children being the number allowed each couple. Love and marriage, with its subsequent family, was the ideal of the race. Before mating, the applicants were subjected to the most rigorous tests before the union of the couple was duly recorded. Seldom, indeed, was it necessary for the applicants to be refused this privilege and, once made, never was a union dissolved. The tests, which were psychological and physical, showed infallibly whether the union would be satisfactory or not. Marriage took place at what we would consider an early age—as soon as both members of the union were mature, which corresponded to an age of eighteen to twenty. The women of Mars were much like the men, save for more rounded limbs and slightly shorter stature. The women were as active members of the planet's economic life as were the men; they held the same offices and incurred the same responsibilities, the only difference being that it was not usual for them to assume these positions until their children were no longer in need of them, for the early training was entrusted to the mothers. The longevity of the Martians surpassed that of the Jewish Methuselah, an age of fourteen hundred years not being uncommon. Sickness was unknown to them and death was usually artificial, for on feeling the effects of old age coming upon them, it was usual to go to one of the state institutions where they were painlessly put into the long sleep that knows no waking. To some of us, this may seem cold-blooded, but on due consideration, it appears to be the most humane procedure; to be a useless member of a community and a parasite upon others is not an enjoyable state.

On the conclusion of this outline, our host, who, we learned later, was no less a personage than the President of Mars, conducted us to the upper story of the vast pile, which formed the "Capitol" of the planet, where the quarters which we were to occupy had been prepared for us. These had been sealed and supplied with compressors to keep the air at our customary atmospheric pressure. Our supplies had been removed from the space flyer and carried there. We were hungry, so we were left to appease our appetites, being directed to call our host when we were ready to accompany him to the laboratories, where we had been asked to undergo an examination by a committee of scientists. Our meal finished, Smythe went to the wall, turned an indicator as he had been instructed, and informed our host that we were ready. Donning our suits, we passed out into the gallery through the air-lock, as directed. In a few minutes one of the numerous torpedo-shaped aircraft that we saw speeding along the air lanes swooped down and settled on the gallery. Our host, who was seated at the controls, invited us to enter. Briefly, the machine was described to us before we left. Under the floor we were shown several cylinders, about a foot long and four inches in diameter, to these were connected heavy wires which led to the driving and lifting mechanism. The latter contained many heavy coils of wire, in a case supported on two rails that were rigidly attached to the framework of the machine over our heads. The source of power was likened to electricity, but must not be confused with that. On flowing through the coils, a repulsive action was developed which drove the machine upwards. Sliding on the two rails, the container so adjusted itself that the center of gravity of the machine was directly below it, thus accommodating itself for varying distribution of the loads the machine carried. A similar arrangement in the stern served to propel the craft; this was mounted on a pivot which allowed the horizontal direction of the driving thrust to be varied by the pilot in order to steer the machine, while a second set of coils in the bow served to retard and stop the car. The power carried in the cylinders was enough to drive the machine at a speed of nine hundred miles per hour for thirty hours.

At my request, Hargraves inquired if the Martians had not discovered how to transmit power by wireless. They had, long ago, was the answer, but its efficiency never reached a very high standard, so it had been abandoned, as everything inefficient was abandoned, as soon as they discovered the source of power they now used, which was practically one hundred per cent efficient, compared with but six per cent of the former.

We rose from the gallery as the operator turned a dial, and then shot forward in a westerly direction, about half a mile above the city which shone with wonderful beauty as the afternoon sun brought out the bold but beautiful color schemes of the architecture. Continuing his description of the flyer and its operation, our pilot informed us that the ceiling of the machine was limited—above seven miles the repulsive force was not enough to support it—that was the reason another type had been developed for interplanetary work.

In a very short time we arrived at our destination, covering the twenty-odd miles that separated the two buildings in four or five minutes. Alighting on one of the ever-present galleries, we were conducted to a chamber in which eight Martians awaited us. I was the first "victim" and was led to an antechamber, in the center of which was a small circular platform. I was directed to stand on this platform, facing a tall white screen. Behind me and to either side of me were circular batteries of lenses, above and below which were arranged long narrow tubes of a transparent medium in front of highly polished reflectors of some greenish material. On a table to the right of the screen were numerous instruments whose use I could not begin to guess, and a piece of apparatus I *did* recognize—a simple conical pendulum.

Directing me to remain motionless, one of the committee took his stand at the table, while the others crowded around the screen. I was suddenly bathed in a greenish glow and on the screen before me there appeared an image of my figure as seen from the front. Suddenly, the chest of my protecting suit seemed to be sliced away in the figure, then the flesh appeared, just as though a vertical slice had been made through my clothing. Gradually, the section plane cut deeper and deeper into my body until the lungs, heart and stomach were shown in section. It was a weird feeling to see oneself portrayed thus, and it was all I could do to remain

motionless. I could feel nothing, no more than one feels the "X-ray," of which this was evidently a glorified example. In a few minutes the plane had passed completely through me, exposing every fiber and nerve of my body in its progress to the scrutiny of the watchers. At the end I was asked to step down and the operator went to the rear of the screen, reappearing with a number of sheets on which I caught a glimpse of my figure as it had appeared on the screen. For a few moments some of these, which had been singled out by the group, were subjected to a careful scrutiny and discussion, then one of them turned to me and asked if I would like to have corrected the various parts of my body which were not functioning properly. I finally understood his suggestion after several repetitions. On ascertaining that it would not take very long, I assented and was then put into the hands of two others who entered at some signal. The sheets were given them and, after a brief discussion of my case, I was led away into an adjoining room. Here I was laid on a long white table, whose surface was covered with some soft smooth material and a metal clamp was attached to each ankle and wrist. All at once there seemed to be a snap in my brain and my consciousness reeled for a moment—at least so it seemed—the bands were removed and I was directed to arise. As I did so, I was astonished to find that my leg, which had troubled me ever since I was unfortunate enough to run foul of a "five-nine" at Vimy Ridge, was as well as the other, and at the same time I realized that my glasses had been removed and that I could see far better than I ever could see with them. I was conducted back to where Smythe and my wife were waiting.

"I thought you were never coming," said my wife. "What have they been doing with you?" I told her, adding that I had not been gone for more than ten minutes.

"Ten minutes! Look at your watch!" she retorted. I looked at my wrist watch, which I had strapped outside the suit I wore. I had been gone nearly an hour and a half! That night, in our own apartments, I found several marks that looked like old scratches on my body. Yet I had never felt the slightest sensation of the operations that had been performed on me. But from that time on, several distressing symptoms that I had had for some time before, never bothered me again. What surgery! I had been stripped, operated upon in no less than six places and dressed, all in the short time that I had been on the table.

After a few minutes Hargraves appeared and was equally surprised to find how long he had been under that wonderful anesthetic. He, too, had "undergone repairs," as he called it.

We now returned to the flyer, to find that it was under the control of another pilot, the President having had an important call during our visit to the laboratories. Our new pilot was one of the many who had volunteered to instruct and entertain us during our visit. We were more than an hour in returning, for our guide took us all over the city, explaining and pointing things out to us. On the morrow, he promised us, he would show us something of the great Martian irrigation system; he, having been a high official in the engineering department, was assigned as our instructor in that subject.

That evening we watched the sunset from our aerie and watched the rising of Phobos, the inner moon of Mars. To an observer from the earth, the moons of Mars present surprising sights, for, poets and non-scientific authors to the contrary, no heavenly bodies rise in the west to the inhabitants of the earth. Yet here on Mars we watched the rising of Phobos in the west, for, moving around its primary as it does, in about 7h. 39m., it moves faster around the planet than the planet turns on its axis. Rising in the *west,* it remains above the horizon for about five and one-half hours; setting in the *east* to reappear in a like interval in the west, running through all its phases in eleven hours. Deimos, the outer moon, was overhead at sundown. Here is another strange sight. The period of Deimos is 30h. 18m., hence *he* rises in the east, but remains above the horizon for over two days. Phobos, the larger of the two moons, appears to have but one-fifth of the diameter of the moon as seen from the earth, while Deimos appears to be but one-twentieth.

While we sat there watching the shades of evening sweep over the city, there came an alarm from the annunciator and we heard the President's voice asking to see us. He entered through the air-lock a minute later and seated himself at the window where we were grouped. He said:

"I was called away this afternoon to witness a new discovery that has just been made. Discoveries are now few and far between with us, and this latest has been stimulated by the news of your intended visit some weeks ago. It is a medical discovery and the result of it is that we will now be able to visit your earth with impunity. The discoverer has found that we can strengthen our bodies so that they will be able to withstand many times the pull of gravitation to which they are subjected here; moreover the drug so increases the resisting power of the body that no disease will affect it, as has been shown by a subject who volunteered to try it on himself. He has been proved to be immune from the most virulent germs, cultures of which were injected into him long enough ago to show definitely if they affected him or not. We have decided to accompany you back to the earth to assist you in your task of developing a system similar to ours, modified where necessary to conform to your special requirements.

"A report from your examiners this afternoon tells me that you are not adapted to use the chemical foods that we use. As perhaps you have noticed, we eat no foods such as you consume; all our nourishment is taken in the concentrated form, in which there is no waste matter. This is one of the main reasons for our longevity. You will have to make the change gradually.

"From now until the end of your stay, you will be shown all that we can show you of this planet, and ample facilities will be given you for each to study that part which interests him most. On your return, you will be accompanied by four other machines—the vanguard of our second invasion."

The President smiled that friendly smile, typical of all the Martians, as he concluded. I wondered, as I gazed out over the city, which was now lit as brightly as day, how long it would be before we would become as truly great as the Martians had become, how long it would be before we would all be able to treat creatures which were as inferior to us as we must be to the Martians with such kindness and with an apparent lack of condescension and no exhibition of superiority; truly the Martians were great and more than worthy of emulation.

CHAPTER VI

THE following day, we were conducted on the promised tour of inspection of the "canals." We had arisen early to see the Morning Star of Mars, a brilliant, silvery white point of light in the eastern sky, accompanied by a fainter one close to it. It was hard to realize that this was our home —over seventy million miles away. Our pilot of the preceding afternoon arrived soon after we had finished breakfast and we were whisked away at once, heading towards the northern polar cap. Following the great circle course of the Dis, a broad belt of cultivated territory running due north and south, which is one of the seven larger "canals" which spread fanwise northward from the Trivium, we sped north at the highest speed the machine could attain. Three hours' flight brought us to the edge of the fast melting cap and from aloft we could see the whole countryside inundated with water as far as the eye could reach. We descended to within a few feet of its surface and our guide pointed out the lateral and main ditches, which were fast carrying the precious fluid to the great underground storage basins. Moving further north, we came to the snow cap itself and here the machine settled while we got out and stretched our legs. It was mere slush, and streams of water had in many places washed the snow away, revealing the cap to be quite thin. We were informed that the maximum amount of snow that fell was fifteen feet, while the average was about ten. We returned to our machine and were then taken eastward to where a great rift showed in the cap. This was the line of one of the canals and fresh vegetation was already springing up under the rays of the early summer sun. Now, turning the machine's nose southward, we proceeded towards the Utopia region and towards the "Wedge of Casius," the latter a great angular marking on the maps of the planet.

Here we found a vast area under intensive cultivation; huge machines plowing, fertilizing and seeding the ground. On request, our pilot dropped down until our machine rested on the top of a gigantic cultivator below. We alighted and were conducted into the interior. The whole structure was vibrant with hidden power as it moved forward at a speed of perhaps ten miles per hour. We were shown into the control room, where the operator sat. Of course we were at once recognized and, leaving his seat, he greeted us, then conducted us below, where he explained the operation of the machine. He would leave it to guide itself for hours. The body of the machine was suspended about two feet above the level ground on endless caterpillar treads. The soil was taken in forward by means of rotary scoops after it had been loosened by the ploughshares; it was then carried to "digestors," which pulverized and prepared it. Samples of the soil taken from four points of the machine's seventy foot width were carried to mechanical analyzers which continuously determined the quantity and kind of fertilizer required to bring it up to perfection for the crops raised here, from which were obtained one of the most important elements of their food supply. The analyzers then automatically regulated the supply of the different fertilizers which were supplied to the "digestors."

On leaving the machine, the soil was spread in the broad furrow from which it had been taken and the process was completed by seeding and rolling. The work was carried on day and night at the rate of over three square miles a day for each machine, thousands of machines being engaged in the task.

Leaving the cultivator, we headed towards the Trivium once more, following a new "canal," the Eunostos, from the point where it leaves the wedge at the Aquae Calidae, for several hundred miles, crossing Elysium and arriving "home" as the sun was setting, tired and hungry, for we had eaten nothing since breakfast.

The land is cultivated for widths from a few hundred yards to ten miles on either side of the great arteries of the planet, depending upon the size of the subterranean aqueduct. In the case of the larger arteries, lateral pipelines convey the precious fluid to the area under cultivation and the growth that follows makes their course visible to the trained eye at the other end of a good instrument under the best observing conditions on the earth.

The next day we were shown the great underground storage basins, hundreds of square miles in extent, where the precious fluid was sealed to prevent loss by evaporation. With each of these vast reservoirs were associated the pumping machinery of the system. We stood in awe under the shadow of the gigantic machines which would dwarf any earthly construction into insignificance, watching the whirling metal shafts and the glittering piston rods as they rose and fell, thudding out the heart beats of the planet which sent its life blood coursing through its artficial veins.

Day after day, during our twenty-seven day stay on the planet, we were kept busily employed. I, of course, took the greatest interest in the astronomical work of the planet and, with a machine that was placed at my disposal, I visited the principal observatories of that world. How tiny even our huge reflectors were, compared with the instruments I saw there. Imagine how I felt when I took my place at the eyepiece of the giant of the giant reflectors, with a mirror more than seven hundred feet across, more than seven thousand times the light-grasping power of the great Mt. Wilson reflector. With the thin Martian air and its exceptional clarity and steadiness, it was possible to make observations with undreamed of powers, powers so great that for the first time I saw stars as disks, tiny disks, it is true, but nevertheless, disks large enough in some cases to see their photospheric disturbances. It is impossible for us on the earth to see any *star*, other than the sun, as a disk, due to the nature of light, until the diameters, and hence the "resolving power," of our instruments are greatly increased.

As the time for our departure drew near, a deep regret was felt by all of us, so much had the inward beauty of the Martians taken hold of us, and we felt that we were leaving a paradise. The one consoling thought was, that we were not returning alone, but with friends who, we felt sure, would soon be able to organize our woefully muddled world into a world that would begin to approach the ideal we had witnessed.

There seems no need for me to go into the details of our return voyage or the surprise of the world by the return of the Martians. The press has blazed with headlines, capping articles that in many cases contained not a grain of truth, and it has only been with difficulty that the little community we have built up has been kept aloof from foolish egotists,

who think they can match their minute brains against the magnificent knowledge of the Martians. We have had to lay down an impregnable barrier devised by our friends around our camp in order that we might not be disturbed while the builders of the new world are studying our planet at every angle, preparatory to launching their campaign. Let the world rest assured; there will be no sudden upheaval, but a gradual change in which the whole of humanity will benefit in a way the idealists have never dreamed of. Even some of my friends, economists and idealists, who thought that they had developed the ideal system, stand in awe of the millenium that looms before them.

THE END.

In this department we shall discuss, every month, topics of interest to readers. The editors invite correspondence on all subjects directly or indirectly related to the stories appearing in this magazine. In case a special personal answer is required, a nominal fee of 25c to cover time and postage is required.

A NUMBER OF FAVORABLE COMMENTS

Editor, AMAZING STORIES:

I just wish to comment upon a few of the more recent stories of your worthy publication.

"The Machine Man of Ardathia" is, in my estimation, a marvelous scientifiction story. Mr. Koblischke in the January issue claims that it is ridiculous; that human beings should ever evolute into sexless automatons is biologically improbable, he thinks. The story states to the effect that the Bi-chanics and the Tri-namics propagated their species by fertilizing the female ovum in ecto-genetic incubators till it was past the embryonic stage of development. The young Bi-chanic or Tri-namic was then encased in a transparent cylinder. Finally, this led to the extinction of the female sex because it was no longer necessary, then the whole race began to die off. *"The Machine Man of Ardathia"* created synthetically the equivalent of the female ovum, and in ecto-genetic incubators developed it; the body after passing the embryonic stage was placed in a transparent cylinder, as had done the Bi-chanics and Tri-namics before them, but it was also supplied with tubes furnishing it the necessary energy for rebuilding its body tissues, which was only a minor affair due to the small amount of muscular activity carried on by the Ardathian. Now, you see, sex was no longer essential. An automaton defined is a machine controlled by some external agency having no volition or cognizance of its own. The Ardathians had both these attributes, wherefore call them automatons! They still thought and reasoned somewhat as humans do. They were not human, they were superhuman.

The Ardathian was probably above most emotions, as we know them. Emotions didn't come from the reaction of their viscera, as it does in our case. They were above emotion, as we know it, for this reason: emotions are traits of mammalia which have been developed through ages of maternal protection. The extinction of sex among the Ardathians withdrew the maternal instinct and its influences eventually died out.

Now, I don't see why this story should be regarded as fantastic or inconceivable. With man's present tendency to rely upon machines to do his work and even his thinking in some cases, the gap between the human being and machine is rapidly lessening in width. This is a great speculative field. The morbid vein in which the story runs is altogether fitting for the circumstances. This story should set some of your readers thinking of the possibilities of truth that are evidenced in body.

"The Face in the Abyss," by Merritt, in your ANNUAL, certainly was splendid. The weaving of legendary lore and tradition into the text of the story improves it. The description of the "face," of "Yu-Atlanchi," of the "Snake Woman," and of the arts of the inhabitants of "Yu-Atlanchi" was remarkable. The science is altogether original in this story.

"The Metal Emperor," now running in SCIENCE AND INVENTION, is as weird and fascinating a story as I have ever read. Fancy metal given volition and cognizance; it isn't possible. The probability of extrosenses is also a strong one—senses that even the Oriental Occultists are unaware of. The story, *"Below the Infra-Red,"* was interesting. It contained a full measure of good, plausible science, but it is altogether too idealistic and the ending too incongruous. Hypnotism is not known to ensue without the aid and co-operation of the recipient; with the hypnotist lure, however, the wills were developed so highly that a strong will could overcome a weaker antagonistic will.

"The Comet Doom" certainly provided me with enough thrills and food for speculative thought. Description of the moment when the earth's fate was in balance with the odds altogether against its coming out victorious was a true touch of mastery by the author when he proposed a last-minute rescue.

L. Cordenas,
Bradley Beach, N. J.

[There's a note of sadness in the story about *"The Machine Man of Ardathia,"* which you put very well in your text. We will agree that man and machine are approaching one another. Sometimes we think that the approach is very close in such establishments as automobile factories. In automatic machinery, there is so much quasi-intelligence, that an automatic man would be a possible concept of the future. Certainly, a man who spends day after day and year after year in putting a minor part on an automobile, that passes slowly by him on a platform, is to all intents and purposes, a machine man as long as he is thus engaged.

But do not imagine that our authors restrict their narratives to absolute possibilities, or rather, probabilities within the range of our judgment and experience. We do not know what the future will bring forth and the world seems ready for any new surprise that may come along. We certainly have had enough wonders to surprise anybody, even in the last five years.—EDITOR.]

BRICKBATS GALORE—OUR COVER ILLUSTRATIONS THE TARGET

Editor, AMAZING STORIES:

In looking over "Discussions," I find that other people have covered my likes and dislikes rather thoroughly, except for one small item; not a large one, and one that may not interest the majority of readers. It is this: Your AMAZING MAGAZINE cover. Outlandish!

Can you imagine a staid business man, middle-aged, with a leaning toward the glamour of science, furtively going up to the newsstand, looking over the magazines till no one is watching, then quickly snatching a copy of AMAZING STORIES, tuck it under his coat, pay the girl and slink away with dread, lest some business acquaintance might see him and think he is reading "Nick Carter," and thereby doubt his business sagacity? Well, my dear editor, that is just my predicament. Do you wonder that I am becoming a nervous wreck? I do not know where you procure the paper that you put into the magazine, nor the terrible colors and illustrations on the outside, but frankly, they are both quite passé, don't you know? Sincerely,

R. F. DeBritt,
(Address not given.)

[We claim that we publish unfavorable as well as favorable criticisms, and we think that this letter, attacking the cover illustrations, proves our claim first stated. There's so much in the illustrations, and the blend of personality and science is so well carried out in them, that we can perfectly well imagine a staid business man buying a copy without being furtive in any way and without being ashamed of himself. So, if the writer is really picturing himself as a purchaser, let him think it over and see whether he is not needlessly disturbed. If he will study the cover illustrations attentively, he will see that sometimes they are very remarkable productions in the line of mechanical detail. The artist, Paul, who does many of them, has a very special ability in the line of producing this class of work, which most artists would find difficult or impossible. Then, too, Mr. DeBritt might subscribe to the magazine. It comes fully wrapped that way!—EDITOR.]

TRAVELING INTO THE FUTURE, AND TIME TRAVELING

Editor, AMAZING STORIES:

I have just been re-reading the *Discussion Columns* in the December issue of your magazine and I notice in it a letter from I. M. Lichtigman of Brooklyn. In it he speaks at length on the Fourth Dimension and brings in an excellent theory about duration of light waves. But does he know why time is considered the Fourth Dimension? If not, I suggest that he take a pencil and draws a line with it on a sheet of paper. Now, if that line is to exist at all it must have length, breadth and time, for, without this, it could not have been drawn.

As it is possible to travel in the three dimensions that we know of, is there any plausible reason why we should not be able to travel in Time? Mr. Lichtigman speaks of a theory of Duration of Light Waves, but this may have nothing whatever to do with it. The idea about time is that, once you have done something, it stays forever in a plane in time. This plane can be traveled in just as any other plane.

As for the writer's few words on traveling into the future, they carry no weight at all. He says that, if nothing exists its picture cannot be made. Quite so, but how does he know that things in the future do not already exist? When a blind man looks into a mirror he does not see his image, nor can he feel, hear, or smell it. Therefore, I suppose, it does not exist. This is all his reasoning comes to.

My theory on Time-traveling is, that if you can Time-travel, you are invisible and have no influence. What would happen if you had? Take one example. Suppose that 30 years ago, when a young man, you had been the owner of a large house and you were debating as to whether you should add an extension to your house or not. You wrote a letter to the builders but threw it away, thinking better of your idea. Then you went to the Continent for a year.

Now, if you can travel through Time and have influence in the past, you could go into the house in safety and re-write the letter, and send it to the builders. The extension is then built.

In the present time, then, a building will suddenly arise out of the ground. But this is obviously ridiculous.

Concerning the illustrations: Paul may be a good artist, but I am very glad that people do not have faces like those of some of the people in his pictures. They are just as bad in *The Metal Emperor* in SCIENCE AND INVENTION. More illustrations, by all means, but less of these faces.

One word in conclusion, do **not** make AMAZING STORIES semi-monthly. It would be too much of a good thing.

Also let us have another Cover Contest.

Wishing AMAZING STORIES a long and prosperous life.

Malcolm E. Humphery,
Norfolk, England.

[Referring to the last clause of your letter first, you will find that there is another cover contest, this time, of a very original kind, and one which we think will excite considerable interest and elicit material perhaps even better than or as good as we secured by our last one. The cover contests are absolutely for the benefit of our readers, to give them fresh literature to read, and to open the gate for new authors to try their hand at writing scientific fiction and to bring out new ideas artistic and scientific.

Of course, traveling through time is quite theoretical and it is, as far as we *now* know, quite impossible, but the beauty of the subject is that it brings up an interesting quantity of discussions; opens up an attractive field of suggestion, and certainly makes people think. Your interesting letter is due precisely to such causes.—EDITOR.]

(Continued on page 86)

Baron Münchhausen's Scientific Adventures

By HUGO GERNSBACK

(*Continued from page 47*)

dicted the existence of a new planet, Neptune, which no one had ever seen before.*

"The Martian that I was gaping at, who was standing nearest to me, was between eight and nine feet tall, a veritable giant. He had an immense head with a straight forehead, at least seven inches high. His light blue eyes were about two inches in diameter and placed close together; moreover, they had a marvelously intelligent, as well as keen look in them, impossible to describe. Their hypnotic gaze held one spellbound and seemed to go clear through you.

"The long thin nose was enormous, but harmonized well with the rest of the face; the complexion was somewhat brown. The large ears stood out straight and looked like enormous oyster shells, with the inside turned towards me. However, what caught my eye particularly was the strange 'caps' all Martians wore. These caps looked as if they were made of a flexible metal. From their back dangled what I thought to be a flexible metal wire. We were soon to know their purpose.

"The chest, or rather the torso of the Martians, was simply out of all proportion to the rest of the body. It was enormous, and made him look strangely top-heavy. His arms appeared thin and emaciated, as did his legs. His hands had each two thumbs and four fingers, the extra thumb being between the thumb and index finger, as compared to the human hand. The hand itself was very small; in fact, it looked much like an Earth woman's hand.

"The feet were almost circular in shape and measured at least 18 inches in diameter. The base looked very much like an elephant's foot, although the ankle was rather small and graceful, as compared to the big flat foot. The outside of the Martian's dress glistened strangely in the sunlight, and I felt sure that it must be made of a flexible metal, unknown to us. It fitted rather loosely and did not appear to have much style. The upper part of the body was enclosed in a sort of blouse, such as our young boys wear on Earth. The trousers looked like knickers, except that they extended down to the ankles.

"While we were still gazing enraptured at these strange, marvelous beings, we suddenly became conscious that our brains were being filled with a wonderful sort of music which seemed to originate inside our heads. Instantly, the Martians who had stood around in a haphazard manner, formed a lane, the center of which was formed by ourselves. At the one end we now perceived a colossal, bewildering structure with a church-like appearance, which seemed to turn around slowly on its axis. When its ponderous portals, measuring at least 200 feet in height, had swung around so that they pointed in our direction, the structure ceased revolving. Immediately the portals slid back and out stepped a distinguished looking Martian, taller even than his brothers. He was dressed like them, except that his metallic cap appeared yellow in color.

"At a gesture, two Martians stepped toward us and, taking off our headgear, replaced them with the soft metallic caps. By this time the distinguished looking Martian had come up close to us and stood still, only five feet away. He next placed the tips of the fingers of both hands to his temples, which we took to be a salute. We hastened to respond likewise, but we must have executed the motion poorly, for a faint, rather amused smile flitted over the brownish features of the august Martian. Then he turned around and some attendants bade us with a motion to follow the chief, which we did. He then entered the church-like structure and we followed him deferentially.

"Well, Alier, my boy, I guess the telegraphone wire must be almost full by this time. So I guess I will have to close for today. Now don't forget to listen in tomorrow night, for there's a lot to be said about this wonderful planet. Good-night. . . ."

A low, rhythmic hum for a few seconds, then click, click-click-click, click, a snapping sound and the ether between the Moon and old mother Earth was undisturbed once more.

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* Jean Joseph Leverrier, a French astronomer, on August 31, 1846, in a paper to the *Ecole Polytechnique*, declared that he had computed the orbit of a supposed new planet still further removed than Uranius, which was then thought to be the last planet in the solar system. Not only did Leverrier predict the new planet, but he predicted it to be a star of the eighth magnitude. Most wonderful of all, however, he actually indicated where this new planet should be located in the heavens, and he asked that astronomers should look for it there. This, Galle, of the Berlin Observatory, did on September 23, of the same year, and he found the new planet within less than 1° from the spot indicated by Leverrier, *who had never seen the planet himself*. Leverrier had based his scientific prophecy upon certain observed irregularities of the planet Uranius, although Neptune is 2,654,560,000 miles away from the earth—an enormous distance.

(*To be continued next month*)

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MUENCHHAUSEN'S RETURN WELCOMED. SOME INTERESTING CRITICISMS OF WRITERS AND ARTISTS

Editor, AMAZING STORIES:

I first made the acquaintance of one I. M. Alier in the *Electrical Experimenter*, and hail his return in AMAZING STORIES with the pleasure one feels on meeting an old friend after years of separation. I was a constant reader of the above-mentioned the magazine and carried on when it became *Science and Invention*. When the contest to name AMAZING STORIES was announced, I looked forward to its publication with keen interest, and every issue has been a source of stimulating thought and pleasurable entertainment.

I have read a number of stories by Edmond Hamilton which contained some excellent science, and was about to inquire as to the probability of some of his work appearing in your magazine when I received my January copy containing "The Comet Doom."

Granting the usual freedom accorded to fiction writers in regard to the statement of unknown or disputed facts, I am still unsatisfied by his description of the movements and positions of the mythical "comet."

Astronomy has been a hobby with me since boyhood, and although I lay no claims to mathematical genius in the realm of astro-physics, I believe you will agree with me in the following statements:

1. The comet of the story *always rises in the east soon after sunset.*
2. It is stated very clearly that the comet "was swinging out again from the sun on its outward journey into space."
3. It is also stated up to the climax of the story that the comet comes closer and closer to the earth.

Now to consider these statements:

The action of the story would have been perfectly logical if the comet *had not risen in the east every night soon after sunset.* To have done so it would have had to be already past the earth and far out into space, getting farther away every day. Had it been traveling in the path ascribed to it, the comet would have either been high in the sky at sunset at the beginning of the story and farther toward the east each successive night, as it passed the earth, or would have risen after midnight and earlier and earlier until it reached the position in the story, depending upon the direction it followed around the sun. Good fiction to describe its rising in splendor in the east each night as the sun set, but poor astronomy. Nevertheless, I shall welcome more stories by Edmond Hamilton.

Just a few comments on your illustrations. I feel the urge to voice an opinion, as I am myself a commercial artist and usually study illustrations quite carefully.

Your artist, Paul, has a combination of several good qualities quite necessary in giving your stories "selling punch." *Good* pen and ink technique, *fine* figures in his drawings, and what is of paramount importance to a magazine like AMAZING STORIES—IMAGINATION!

I have detected several small "slips" I wish you would pass along. I cannot recall the exact issue, but I remember noticing at the time that in the story of "The Singing Weapon," Paul has *two* bright lights shining on the form of the Asiatic but only *one* shadow is cast on the wall behind it. The story says the inventor was killed by the smallest vibranon he had ever made, but there are several shown which are smaller than the one he is holding.

In "The Time Machine," if my memory is true, Wells has his hero depart into the future in a dinner coat. He arrives in "plus fours."

In the more recent "The Psychological Solution," the greatest mystery to me was what became of the left side of the face of the man in the background seen between Dr. Thane and the young biologist.

But I can truthfully say that I have enjoyed Paul's sketches fully as much as the stories themselves. So as one artist to another, please pass along my sincere appreciation of his work.

W. E. Moore,
Fremont, Ohio.

[We are happy to find a reader of *Electrical Experimenter* who is glad to meet an old friend, I. M. Alier. And by the way, none of our correspondents have shown any signs of "catching on," as the boys would say, to the meaning of this name.

"The Comet Doom" is not to be taken as a methodical treatise, but we think it a very good story and one with considerable power. What we say is confirmed by the fact that our readers have given us many favorable comments on this very story.

We are glad that you compliment our artist, Paul. He has a very unusual faculty for illustrating scientific stories into which apparatus of all sorts enters.

As regards "The Time Machine," it is quite possible that the trousers that went with his dinner suit were of the loose Oxford cut.

The figure in "The Psychological Solution" had his face partly hidden behind the pipe, and we admit that by inadvertence, a little bit of the outline seems to have been omitted.

In "The Singing Weapon," we do not find an obvious error in the shadows and a little indulgence may be asked perhaps for the relative size of the vibrator, which is killing the investigator —EDITOR.]

CRITICAL NOTES ON SEVERAL OF OUR STORIES

Editor, AMAZING STORIES:

I have been a reader of your AMAZING STORIES for four months. But I have been a reader of *Science and Invention, Popular Mechanics, Popular Science, Scientific American, Literary Digest*, and the *System or Magazine of Business* for the past five years. I keep a memorandum, sometimes taking the leaves from them for future reference I cannot get the satisfaction from fiction that I can from magazines I have just mentioned.

The criticism which I am going to write to you may be crude, not well construed and collective in the translating of the articles, but my hope is that with your experience from a multitude of correspondence you undoubtedly get from various individuals, you can get the trend of thought I am trying to intelligently impart to you.

My criticism is for the February issue of your unique and interesting magazine. I will give you my opinion of the various stories: Believing at least that I am nearly on an equal with the average individual who reads this issue, some expect more, some cannot grasp the thought, and claim it to be impossible, but looking through the issues of magazines I have already mentioned and the present-day achievements, I say that not anything is impossible, when the time comes for humanity to go on and use that thing to an advantage, which seems impossible today. These things will gather in the list of achievements as other things have in the past.

The Revolt of Pedestrians

I say it holds an inkling of the future, it seems drastic, absurd but, for instance, today: office people, not all, but a small per cent, do not walk in a day's time, I say three miles. It is a bus, elevator, auto, elevated, surface lines, suburban train or subway. It is a well told story, very fitting for this magazine of yours.

Baron Muenchhausen

Part I is very good in itself, but short; it contains incidents and suggestions that are food for thought, things that are near reality.

Part II takes the mind away from Part I, very exaggerated in self-praise, very humiliating to the achievements of the Baron in Part I, possibly so in Parts III and IV from their titles.

The Master of the World

A story which cannot be criticized fully without Part II, but a seemingly good narrative, and well plotted.

Pollock and the Porrah Man

A narrative, incredulous, superstitious. Pollock must be easily disturbed or slightly demented on this subject (voodooism) evidently not a seasoned hunter or traveler of the scientist class of explorers.

Fourth Dimensional Surgery

An appealing narrative of good imagination, for one thing, in the professions it mentions, a thought to the Lasker donation for prolonging life, surgery in the next century or so, who knows.

The Disintegrating Ray

Very good narrative for the thinker, chemistry or electrical research. Science is always interesting, whether imaginative to a certain degree or not. This story would be an appeal for greater researches and a gentle reminder of the martyrs of science.

The Fourteenth Earth

The trend of imaginative thought is good, but does not complete the validity or void the transaction of the return of Kingston.

The Fighting Heart

A theme which many should read and a good tonic for doctors to practice, for there are many with the afflictions described here.

Smoke Rings

A short narrative with a thought as to whether it is possible to any certain degree, but containing ideas that are not entirely imaginative; a very good chance for research.

Illustrations tell half the story. Chinese Proverb: "A picture is worth 500 words." A narrative of the trenches in the world war was very little to the officers, but the airplane camera brought the actuality of the trenches before them and also could be consulted again for refreshing the ideas within the mind.

More illustrations in some stories, and less elsewhere; some stories require more pictures to excite the imagination to the right pitch for the narrative to be interesting. But I would not discontinue them or the questions; the questions to you are the same as applause to a vaudeville manager and tells what the people want, but you cannot please all.

I hope I have not taken up a great amount of your time, but hope I may have done some good with my ideas and suggestions.

Thomas R. Clark,
Chicago, Ill.

[The opening paragraph of your letter in one sense, brings out the goal to which we are reaching. The object of AMAZING STORIES is to supply fiction, and the fiction is to be based on natural science, so that the person who reads AMAZING STORIES will not feel that he is wasting his time on imaginary adventures and episodes, but will realize that he is studying science, or perhaps imbibing science.

The kind of letters we receive tell us that we are succeeding in our efforts in this direction. Our Discussion Column is extremely interesting, because the letters come from people who think, and the tribute to our efforts is that they think clearly and write clearly on the topics brought

forward in our stories. We appreciate the sentiment indicated by your view that not anything is impossible, and the achievements of the last few decades have been so wonderful that they have almost destroyed our sense of astonishment.

As regards *"The Master of the World,"* you will find that the end is very satisfactory, and you will not know what it is until you reach the concluding paragraph.

Mr. Wells, among his other merits as an author, has the faculty of giving what is called "atmosphere." This appears in *"Pollock and the Porroh Man,"* where there is an atmosphere of utter dreariness, which is very impressive. Psychology plays an all-important part in this story. We are very glad to see your statement that science is interesting, even if imaginative. Without imagination, there would be few discoveries made. Imagination is all important in the laboratory. We publish your letter with great pleasure.—EDITOR.]

THREE DIMENSIONS AND FOUR DIMENSIONS—FUNDAMENTAL CONCEPTIONS

Editor, AMAZING STORIES:

As an interested reader of AMAZING STORIES I feel that I speak for the great majority of readers when I say that stories in which time is turned backward or forward are impossible. Time is something that cannot be tampered with; all that is with us is the present. The past has already gone, and the future is yet to come.

Authors, realizing that a trip into the future or past would make an interesting story, cast about for scientific means of accomplishing time-traveling. Finally, one hit upon the idea of defining time as the fourth dimension and travelling in that. Then he gave a talk with flawless proofs that one should be able to travel in the fourth dimension as well as any other. Very convincing, but taking too much for granted. Is time the fourth dimension?

No, it is not. It is not a dimension any more than mass, or weight is. You may argue that a thing cannot exist without duration; something that exists only instantaneously, without existing any time at all, cannot be said to exist at all. Therefore, time is needed and is a dimension as surely as length, height and width. But why pick only on time? Can a thing be said to exist without mass?

Certainly not; that is a foolish question because something with the three dimensions has automatically mass. There you are—something with the three dimensions has automatically time, or duration.

Our authors seem to have the wrong conception of a dimension. Length, height, and width are dimensions—we can see them, and measure them. You can point out no object that has other than these dimensions. They are something tangible in which it is possible to move. Then why bring in an abstract term—something which one cannot see, or touch? You cannot even talk about time intelligently, much less define it. The dictionary says that time is a measure of duration. It defines duration as a continuance in time, or permanency, and it defines permanency as duration. The inability of one to define time well enough is proof of its nothingness—why try to travel in nothing? Time is *nothing* in the last sense of the word. It cannot be measured. You can measure only the difference between one moment and the other, and that by using the difference between the marks on a clock or watch.

When you come down to the point, nothing can be measured except by the three known dimensions. A thermometer is read by how high up the column of mercury is from zero. Not even mass can be directly measured, except in a few cases, and most of the time it is reckoned by its relation to length, height, and breadth. You tell weight by how far down a spring goes when something is pulling down on it. *Everything comes back to the three dimensions.* They are the only thing it is possible to be in, therefore the only things it is possible to move in. An immaterial term cannot be associated with a material body.

The fourth dimension idea seems to be the principal one used in time-traveling stories, although in one, "The Astounding Discoveries of Doctor Mentiroso," this man has a machine which travels faster than the earth. He reasoned that if it were 9 A. M. in San Francisco and he could travel instantaneously to New York it would be twelve at noon, so he would go three hours into the future. Of course this type is not to be considered, and the only other time-traveling scheme is in connection with light waves reflected from the earth. If you capture these away out in space the scenes will be re-enacted, but this is no more traveling into the past than seeing moving pictures.

But I believe the best proof that time-traveling will never be attained is the absence of travellers now. The future beings do not come back to this era, for we do not see them; and as no one has seen or talked with any, it means that this ambition will never be realized. If they recede in time at all, they will come back indefinitely, and we would see them. What better proof would one need?

Yes, the average reader realizes that time-traveling stories are a lot of "bunk," and I think that you will agree with me that he does.

I hope I have made myself clear in this letter, and I thank you for the opportunity of being able to express my opinions in the magazine.

D. L. Cumming,
Elizabeth, N. J.

[The subject of dimensions has received very extensive application in physics and all the physical units have been referred to and based methodically upon the fundamental dimensions or units, those of time, length and mass. And now, in the midst of this, which has led to a very interesting working out of the units, mechanically and physically, there appears the fourth dimension, and the effect seems to be occasioning considerable confusion.

We want to say about this letter, what we said about others, that it is so well put that comment is unnecessary. It is interesting reading.—EDITOR.]

READERS' VOTE OF PREFERENCE

Stories I Like:

(1).....

.....

(2).....

.....

(3).....

.....

Stories I Do Not Like:

(2).....

.....

(1).....

.....

Do you want the questionnaire to continue?.....

Do you like the illustrations as we have them now?.....

Do you favor more illustrations than we have now?.....

Would you rather have no illustrations at all?.....

Name .....

Address .....

City .....

This is YOUR magazine. Only by knowing what stories you like can we please you. Fill out this coupon or copy it and mail to AMAZING STORIES, 230 Fifth Avenue, New York City.

A WREATH FOR DR. DAVID H. KELLER

Editor, AMAZING STORIES:

I want to tell you how very much I enjoyed the story in your magazine for February, by Dr. David H. Keller, "The Revolt of the Pedestrians." It is far the most interesting story I have read. It is so different—so very amazing. It certainly gives this generation much to think about. Many of the girls here have read the story, and all of them liked it so well, we decided to write to you and ask you to request the author to write more of that type. We will be looking forward to more of his stories.

Florine E. Blount,
Fort Worth, Tex.

[Dr. Keller's way of pushing to an ultimate conclusion the effect of the automobile on man, may do considerable good, inspiring people with the idea that exercise is excellent for the body, which, of course, everybody knows, but which people seem to have forgotten, as far as walking is concerned.

The beauty of walking is that when properly done and in good form, the whole body is involved in the process, and the mechanical perfection of a long-distance walker, as indicated by his gait, is most interesting. The question of how to walk has received much study by military authorities, as for instance: straight-leg walking, proper length of step, miles per hour, and other details. The care of the foot, the preservation of the arch, the proper shape of the soldier's shoe, have been made the subject of a very interesting monograph by an army officer, and in "The Revolt of the Pedestrians," the human foot and leg are pictured as atrophied and pedestrianism is featured as a sort of disgrace.

There's a lot of morality in Dr. Keller's story. —EDITOR.]

AN ENCOURAGING AND APPRECIATIVE LETTER

Editor, AMAZING STORIES:

I have been an enthusiastic follower and booster of AMAZING STORIES since its first issue, but this is the first time I have had the inspiration to break forth into the public limelight, so here goes, short and to the point.

I heartily endorse the suggestion made by one of my fellow readers as to the forming of an International Science Club, with AMAZING STORIES its official organ. I think International Science Club would be a much better name than Young Men's Science Club, if that name doesn't conflict with existing organizations. I am sure none of us would object to a small fee for membership to pay for membership cards, enrollment, etc. Then AMAZING STORIES could devote a page to scientific discussions and matters pertaining to the club. Let's go!

Here are a few other suggestions which I am sure will appeal to many regarding the present form of the magazine. You have already promised us better quality paper, so I will pass that over. I notice that the word SCIENTIFICTION does not appear on the cover of the magazine at all. Now I think that is a sad omission, because there are many that are not familiar with AMAZING STORIES and imagine it is a concoction of weird, eerie, hair-raising thrillers, instead of a delightful set of stories based on scientific knowledge and fact. I am sure the latter impression is the one most desirable to cultivate. By all means do not consider doing away with either the editorial page or with the discussions and the comments. I would also suggest a page devoted to jokes of a scientific nature similar to the one conducted in SCIENCE AND INVENTION.

I will not commit myself as to which stories I like or dislike as that is a matter of personal opinion. The sooner the readers realize this and stop panning this story or that, the better they will enjoy the magazine, and will not tire the patience of the other "Discussions" readers, by their, "I like this," "I think that was rotten," etc., and then read in the next letter exactly the opposite opinion.

I hope I haven't tired you with all this chatter, and hope I have done my bit to make AMAZING STORIES what we all want it to be.

Benjamin Domingo,
125 Harvard Street,
Medford, Mass.

[You will find in these Discussion Columns, various letters dealing with the club question, which we assure you, you will read with interest. But as we said before, our readers must get up the club, and do the organizing, and they will have the advantage of having an organ which, from its own viewpoint, will warmly espouse the cause.

You will understand that the object of the discussions column, is precisely to let our readers know what is thought of the magazine by others. We make no effort to exclude unfavorable criticism but are glad to put it in, although we may entirely disagree with it. Your point of view, expressed in the next to the last paragraph of your letter, however, just cannot be made a criterion for selecting letters to be printed. We want our readers to understand that unfavorable criticisms are printed in these columns without hesitation.

The better quality paper, we hope, will soon be realized for AMAZING STORIES—as soon as the magazine has been put on a paying basis.

Your suggestion to have the word "Scientifiction" appear on the front cover is an excellent one and has been suggested by a number of other readers. Our Art Department has not been able to fit it on the cover though, without crowding it. But it may be done in the near future.—EDITOR.]

FRIENDLY CRITICISMS FROM ENGLAND

Editor, AMAZING STORIES:

It is unnecessary for me to say that I like your magazine because if I did not I would not buy it every month.

I have, however, one or two criticisms to make.

I cannot force myself to "swallow" any fourth dimension-time-traveling story yet because it is absurd.

Quite a number of people have proved conclusively that you cannot travel in time, because if you did you would not see your real past or at least the people in the past would not see you. Also you, in the present, cannot see the future because it has not yet happened—and we are not optimists who think everything is "written" and ended, that all science is in the books.

The Earth travels around the Sun and the Sun is rushing through *space* at a high speed. We know this and yet such writers as H. G. Wells tell us that although they go back in time without altering their position (their *real* position) they find the Earth a thousand years ago in the same place as it is today, or rather *now*.

Supposing you could go back in time you would find that the earth has not reached you yet and will not until you reach your original present in which you were a few minutes *ago* but which is *now* in the *future*.

I cannot see the necessity of having, in "Rice's Ray," a vacuum between the walls of the machine when they have millions of miles of vacuum outside.

We know of the tremendous electric storms that occur on the sun constantly. Then, why were not Rice and his companions electrocuted on directing the ray towards the Sun?

Mr. Rice states that the revolution of Venus is of about 23 hours duration. Schiaparelli, however, has taken its "day" equal to its "year" (225 of our days) and this I think is now taken as correct.

I have read practically all Verne's and Wells' books and I suggest that you should publish "Men Like Gods" some time or other.

I will not say anything against Dr. Mentiroso except that a circle has two dimensions but as they are identical in length it is convenient to consider one only.

It is true that some people have very little imagination but still I wish the inhabitants of Mars, Venus or a comet would not *always* have a head on top a body underneath and the arms and legs at the same place as we have them. That is the reason why I liked "The Men from the Pit" and similar stories.

I don't like "prehistoric" stories as "A Story of the Stone Age" and I wish Gravity Nullifiers Screens and Rays were explained in a more scientific and fuller way.

R. A. Eades,
59 Petersboro Road,
Richmond, Surrey, England.

P. S. Do you publish *all* letters in the "Discussions"?

P. S. 2. Please do not tell me that it is interesting how these stories make me think.

[This letter is so complete that we have little to say about it.

The time you give for the rotation of the planet Venus, is generally accepted as pretty nearly correct, but it is more or less uncertain.

Our authors have a great way of modifying human traits, which may be taken as belonging to planetary brothers. You see the development of the human system along curious lines which the author may select, goes to tell the story of his future changes, and of the development which some believe is impending for mankind in the direction of the enlargement of the intellectual element in his nature. But, unfortunately, some people think it is the other way and that man is evoluting downwards. Certainly the great war at the acme of our civilization and the possibility, if not probability of any such contest, impending in the near future, are sad reflections on human evolution. Sometimes it looks as though the universe was definitely going in the wrong direction.

We publish only those letters in these columns that are of interest to the majority. It is impossible to print all letters.—EDITOR.]

THE "COMET DOOM" AND WHAT SHOULD HAPPEN TO THE EARTH

Editor, AMAZING STORIES:

Last month I enoyed *"The Comet Doom"* immensely. There is only one point that I am uncertain about. The author states that after being led out of its orbit the earth slowly returned to its path around the sun. This is not true, for, if the earth should slow up, as stated in the story, it would lose part of its centrifugal force and the gravitation of the sun would pull at it with such tremendous power that the earth would plunge into that heavenly body. Even if the earth had been stopped the least bit, the sun's gravity would pull the earth so near that luminous body that life on the earth would be impossible on account of the great heat. I would be very much pleased if you would correct me in any of my statements.

Edmund Perks,
New York, N. Y.

[*"The Comet Doom"* may be taken as correct in principle, but altogether incorrect in magnitude. It would be hard to imagine a moon capable of causing cosmic disturbance affecting our earth without occasioning the ruin or destruction of all living creatures. So you must forgive our author if he tries to spare our globe from total ruin.—EDITOR.]

PROPOSED TRIP TO VENUS

Editor, AMAZING STORIES:

I am enclosing an article from the "Atlantic City Union." No doubt you will find this article interesting.

I am only 14 years of age but I find your magazine most interesting.

Daniel Fischman,
2680 Maryland Ave., Atlantic City, N. J.

PLANS FLIGHT TO THE MOON

Machine Capable of 2400 Miles a Minute, Needed for Fantastic "Hop"

Miami, Fla., Dec. 16 (U.P.)—The most fantastic project ever devised, a flight to the planet Venus, millions of miles away, was announced today.

The man who proposed to make Jules Verne's trip to the moon look like child's play is Robert Condit, of Condit, Ohio, an obscure chemist and engineer.

With intense earnestness, he insisted at the workshop where he is assembling his invention that the trip is feasible.

"The motive power for the machine," he said, "to be used through the earth's atmosphere for the first 30 or 40 miles will be principally from a slow explosive derived from the most powerful alkali known—peroxide of sodium—used as a direct propeller.

"After leaving the earth's atmosphere the propelling power will be a network of units capable of being polarized with the attraction of other planets and orbits of meteor streams other than the earth's. The necessary maximum speed for such a flight would be 2400 miles a minute.

Condit, about 35 and an ex-service man, arrived here a week ago and began the construction of a building resembling an airplane hangar at the surf's edge. Next he built about it a board fence six feet high.

He refused to discuss more secret details of his experiment, although he apparently has adequate financial backing. He will not be ready for his attempt before Jan. 24.

[The cutting must speak for itself and we give it to show that the impossible stories of interplanetary travel which we publish, are to be found duplicated sometimes in the news of the day, but Mr. Condit is either a very imaginative person—or perhaps unimaginative. He hardly will go to the moon. We use the term duplicated—Mr. Condit will not duplicate our stories of interplanetary or of "intersatellite" travel.

Appreciation from our younger readers is always welcome. Their criticism is sincere and often acute.—EDITOR.]

A "STAUNCH SUPPORTER" OF AMAZING STORIES

Editor, AMAZING STORIES:

The reason I am writing is to bring to your notice the enclosed cutting describing a mechanical man which follows the orders of a human voice. I remember reading about a mechanical body for a man in "The Man With the Queer Head," a story where the author seems to touch upon imaginative things. Here is a mechanical man that goes him one better. It is a cutting from a New York daily. Another example of your motto "Extravagant Fiction Today—Cold Fact Tomorrow." I enjoy all the stories printed in your magazine. I would like to have some more "Mad Planet" stories and the sequel to "The Face in the Abyss." I am for a semi-annual with complete stories. Also for semi-monthly publication with more illustrations, such as you had in the "Master Mind of Mars."

I hope this cutting is something you haven't heard of before. I am a staunch supporter of AMAZING STORIES.

Fred D. Scott,
647 Academy Street,
New York, N. Y.

MECHANICAL MAN FOLLOWS ORDERS OF HUMAN VOICE

The mechanical man, a machine which responds in action to the human voice, has been perfected and put into operation by engineers of the Westinghouse Electric and Manufacturing Company, it was announced last night.

The so-called electric men when addressed in the proper tones will reply by means of sound waves within the human voice register, giving correct information and carrying out various orders.

At a demonstration given yesterday at the offices of the Westinghouse Company, 150 Broadway, on the first syllable transmitted to one of these electric workers, a series of lights were lit. At the second syllable, the automaton started an electric fan. A searchlight was turned on by a third syllable. At a fourth it operated an automatic sweeper. A fifth syllable was pronounced and the mechanical man started a signal lamp.

The automaton responds only to sound. It must be ordered in just the precise tone. It works with amazing speed.

[The "Mechanical Man," as the imaginative reporter terms it, responds to sounds of exactly accurate pitch. It is set to do this and the sounds are produced mechanically and electrically. It does not respond to the mere voice—the human organs cannot give the requisite notes. It is very fully described in the January issue of *Science and Invention.*—EDITOR.]

THE ATOMIC PICTURE OF THE UNIVERSE

Editor, AMAZING STORIES:

I am more interested in "AMAZING STORIES" than in any fiction magazine published. To me, the most amazing idea is that of "the edge of space," by Ray Cummings, in "Around the Universe." If the atom is ether surrounded by a shell of matter, it is possible, even probable, that the macrocosmic spaces are also, and that we are living in a stupendous atom. Your writers, some of them, are coming very near the inner secrets of the Cosmos. Grace Pearl Bronaugh,
Oxnard, Calif.

[The idea of the "edge of space" is quite interesting and the many shells ranging from atoms up to the Cosmos certainly give a strange aspect of the universe. Does it not sometimes seem that man, instead of increasing the sum of his knowledge, only increases his realization of how little he does know? Our ignorance should impress us as apalling, and some of the wildest flights of our imagination may approximate to future matter of fact.

Space has long been one of the mysteries of the world. In the older philosophies it was much discussed with little satisfactory result. The idea of space being curved and returning into itself does not satisfy the intellect.—EDITOR.]

CRITICISM FROM A HIGH SCHOOL STUDENT

Editor, AMAZING STORIES:

I have been a reader of AMAZING STORIES since the first issue, which, I believe, was April, 1926. I have enjoyed every issue immensely and have praised the magazine to the sky to all my friends. It is surprising to me how few people are interested in scientifiction or even in scientific developments of modern times. I am a senior in High School and of all my friends whom I have tried to get interested in your magazine I have succeeded with only four or five. Of course, these facts do not serve to show that AMAZING STORIES is not popular, it merely serves to point out the fact that so few people (in the "teen age") are interested in science. However it turns out to be true that those who are interested from the first, in this sort of reading, become most ardent perusers afterwards. I am looking forward to AMAZING STORIES to instill into the minds of some of these uninterested people the expansion of modern science's marvels into greater marvels of future years.

Perhaps you, the editor of an "adult" magazine, will not listen to the criticisms of a mere High School student. But, as I see it, the present High School student is fairly capable of discussing science topics of today, and tomorrow, with considerable knowledge gained from the studies of High School science.

As to my criticism of the magazine, I have only a few to make. I will list them in a manner which is easier to read.

1. The stories all satisfy me. Each author has his own particular style which gives variety and change.

2. The drawings are certainly not artfully drawn but they satisfy me. I would not mind seeing more of them.

3. The bindings certainly are weak for the preservation of the magazines and I would like to see better ones. I realize, though, the cost of better ones. I have devised a way of affixing cardboard covers on my issues which make them much stronger for keeping and reading them over.

4. After reading your announcement in the February issue of AMAZING STORIES about the Quarterly I wish to state that it sounds very good to me.

5. The quality of AMAZING STORIES paper fully satisfies me. I do not mind it being rough, as it is, as long as the ink from the printing does not blot in places and as long as the paper does not easily tear.

As I used to occasionally read SCIENCE AND INVENTION, I used to notice some of Ray Cummings serials which looked very good to me. I wish you could consider reprinting them in AMAZING STORIES.

I cannot think of any special criticism to separate stories as I can truthfully say that I have enjoyed every one of them. I shall be satisfied with similar ones any time.

James Shepard Klar,
41 Dartmouth Street, Springfield, Mass.

[We have said over and over again that we appreciate the criticisms of the younger minds because of the fact that the adult mind is apt to think in grooves, so when we say that we enjoy criticisms from the young, we speak the truth.

You must remember that the drawings for our stories require peculiar treatment by the artist. The artist has to have a scientific and mechanical feeling in his work, and Mr. Paul is pre-eminently good in this line.

Rough surface paper is good for the eyes. The extensive use of half-tones in some other magazines has brought about the use of glossy paper, which is most disagreeable for the reader.

As regards reprinting stories from SCIENCE AND INVENTION, this is something we cannot do too freely. Many of our readers are old time friends of SCIENCE AND INVENTION and we have to think of them, but we feel that it is a practice which we can very well carry out occasionally.—EDITOR.]

A LIST OF PREFERRED STORIES—WHO WAS BARON MUENCHHAUSEN?

Editor, AMAZING STORIES:

After having read the February issue of AMAZING STORIES, I wish to state my preference of the stories. Here it is in order: "The Revolt of the Pedestrians," "Pollock and the Porroh Man," "Baron Münchhausen's Scientific Adventures," "Four Dimensional Surgery," "The Fighting Heart," "The Disintegrating Ray," "The Fourteenth Earth," "Smoke Rings."

I do not wish to forget the poems by Leland S. Copeland. They are very interesting and serve as food for thought.

In regard to Baron Münchhausen, I find in the Stratford edition of his travels published by the F. M. Lupton Publishing Co., New York (no date given), the following:

"In fact, recent investigation has rendered it almost a certainty that the original author of 'Münchhausen's Travels' was a learned but unprincipled scholar, of the name of R. E. Raspe, who had taken refuge in this country from the pursuit of justice (vide *Gentleman's Magazine,* January, 1857), and that many of his stories are of ancient date, and current in various countries. Many are to be found under the title of 'Mendacia Ridicula,' in volume 3 of 'Deliciae Academicae,' Heilbron, 1665; that of 'sound being frozen in a post-horn' is from Rabelais, appears to have been known also in Spain and Italy, and is said by a writer in 'Notes and Queries' (No. 61, 1850) to be traceable to one of the later Greek writers, from whom Jeremy Taylor, in one of his sermons, borrows it as an illustration; while the story of 'the horse cut in two by the porcullis' is translated by Lady C. Guest, in 'The Mabinogion,' from an ancient Welsh manuscript."

In line with Mr. Ostrander's suggestion, I would like to see Edgar Allan Poe's story, "The Thousand-and-Second Tale of Scheherazade," printed in AMAZING STORIES.

I am not in favor of having a semi-monthly magazine, but think the "Quarterly" is excellent.

Earle Floathe,
611 Walnut St., Pendleton, Ore.

[We are glad to get the list of the stories which you prefer, in the order of preference. We are very glad to note that *Pollock and the Porroh Man* is in a high position, because the story impressed us very vividly with a sense of horror, as it might be expressed, and it certainly develops a fine line of hypnotic effects and impressions.

The temperature of the tropic world is very well given and it is in the production of atmosphere that Mr. Wells particularly excels. It will be of interest to note that he is a graduate with honor, in Zoology.

Your notes on Baron Münchhausen are very interesting and go to carry out the proverb that there is nothing new under the sun.

We're glad to tell you that Edgar Allan Poe's story *The Thousand-and-Second Tale of Scheherazade,"* is to have an early publication in AMAZING STORIES.—EDITOR.]

THE ANNUAL AND QUARTERLY—WELLS AND VERNE

Editor, AMAZING STORIES:

February number just here today. What is the matter with the magazine lately? Have noticed during the last few months that it seems to be coming later and later.

Congratulate you on your decision to publish a QUARTERLY in addition to the monthly. Only kick I have refers to the reprints. The ANNUAL was about half spoiled by reprints; at least give us the QUARTERLY of new stuff. I like H. G. Wells, and "When the Sleeper Wakes" is a good story but I can't get nearly as much kick out of reading it again, as I could out of some story I had never seen.

Another suggestion that incidentally backs up one which I read some months ago in the section used for discussions. If the present conditions do not permit publishing much but reprints, why not scatter your stories a trifle more and not give us so much of Wells, Verne and others. Jules Verne and Wells edition after edition. I like Wells fairly well but Verne is terrible. Undoubtedly he has an imagination and prophecied amazingly for his time and period, but outside of his ability to describe well and his gift of imagination he is a very dim bulb. His "Frycollin" in that last atrocity "Robur the Conqueror" would make a horse laugh. You can't expect a dyed-in-the-wool Frenchman to have an Anglo-Saxon sense of humor and "Carolesque" Anglo Saxon attitude. The characters strike me as pathetic. Almost as bad as the slapstick humor in the funny (?) stories you have been running.

Almost missed the second instalment of that particular tale—passed it up until I had to buy it because I wanted something to read and couldn't seem to see anything else. The rest of it was very good even if I had read Wells' "The Stolen Body" umpteen times in various magazines and books.

Mr. Middleton's rather lengthy letter was interesting, though I cannot wholly agree with him, especially in his criticism of "The War of the Worlds." The narrator was not very much concerned with what the rest of England was doing. He was simply telling what befell him and those with whom he was intimately connected. The rest was a dream of noises more or less and probably Mr. Middleton, if placed in a like position today, would not pause to get a copy of the *Examiner* or consult the Boston *Globe* as to what someone else thought. He would be making tracks as far apart as possible. As for gas masks and planes and all our modern

implements of warfare—that is on a par with the chap who wrote asking for the plans for a small ark when he read Serviss' "The Second Deluge."

Anyway I wish you luck in the new venture and trust that you will heed my suggestion and scatter the reprints as much as possible. You'd have a nice little magazine if it wasn't for so much Verne and so many of those senseless, foolish, trivial "funny"? stories.

John F. Macaloffer,
Portland, Me.

[It is not the Editor's fault if Amazing Stories is slow about getting to Maine. We are glad to know, however, that you do not like to have it delayed even.

One of the perplexities of an editor, is certainly to please the greatest number of readers. The flood of letters which we receive, give all sorts of views concerning our writers' work. H. G. Wells is perhaps the most discussed author, his stories exciting the dislike of some people and eliciting praise from others. Some people directly ask for reprints as from Science and Invention and others object to reprints. You do not like Jules Verne, who made an immense reputation and whose wild extravaganzas, have in many cases, proved the fore-runners of man's everyday achievements of late years. Is not the fact that Jules Verne's stories have been put upon the film and have won great success with the audiences a tribute to their merit?

The idea of the Discussions Column and what we wish to be a prominent feature of it, is the publication of unfavorable as well as favorable letters. The unfavorable criticisms are in many cases useful guides, but it is really a puzzle to know what to do. When a controversy exists about a particular author, and is carried on energetically on both sides, ask yourself what would you do if you were in our place?

The funny stories to which you object, have impressed us and many others very favorably. Do you not think that if you had a little more "Anglo-Saxon" humor, as you call it, in your composition, that you would appreciate them more? You like "Alice in Wonderland" and "in the Looking Glass." We know that we enjoy the "funny stories" you dislike, and it is hard to believe that the things which so impressed one, did not impress another at all.—EDITOR.]

A WELCOME TO THE QUARTERLY—WHAT IS SOUND?

Editor, Amazing Stories:

I've been reading Amazing Stories for a very long time and I am well pleased to hear about the Quarterly.

I find your stories very exciting and in fact when I start to read the book if it isn't too late—why I'll sit down and read the whole book in a few hours' time.

Your stories really grip and when you start to read them you can't let go.

There's a question I would like to ask you, a very puzzling question which got me into many quarrels with my friends.

The question is—Noise is made by the ear, am I not right?

Now then suppose a .38-calibre pistol was fired off way out in the woods by means of a string or something else, and there wasn't anything around to hear it.

Did it make a noise? I brought this subject up to my friends and when I said it didn't make a noise they all laughed at me.

Now here is my point of view—if noise is made by the ear and nobody around to hear it, of course it didn't make a noise.

I've heard noise is only vibrations which the ear transforms to sound.

Now take a deaf man—a gun is fired, the sound vibrations are there, but his ears won't make sound and of course he can't hear it. The same with the gun out in the woods. Am I not right?

I am hoping I will see this question answered in your next edition of Amazing Stories as it has caused me very much confusion with my friends.

I liked your story of *The Comet Doom* in your January edition, and I found it so very interesting I read the story three times.

Arthur White,
1139 Bank St., Curti, Ohio.

[Whether the pistol fired in the desert of Sahara, would make a noise or not, is a matter of definition—a question of the subjective and the objective. The subjective definition of noise would be, we suppose, vibrations of air affecting the auditory nerves. A good objective one would be vibrations of air within the range of audition. You see, the second definition does not include the idea of a hearer. The question has been asked over and over again and has been discussed to the point of weariness. Our general advice would be for you to treat it as a matter of definition, and before attempting to argue about it, to get an authoritative statement of what class of noise you are to speak about. Webster's Dictionary gives two definitions of sound which correspond closely to the subjective and objective definitions of noise given above. So if the pistol was fired, by a time fuse or otherwise, so that nobody could hear it, we might call that objective sound. If it was heard, it would be subjective sound. But do not say that the ear "makes sound."—EDITOR.]

AN ADMIRER OF H. G. WELLS GIVES HIS VIEWS ON TIME TRAVEL

Editor, AMAZING STORIES:

After having read your magazine regularly for over a year, I am sending you, for the first time, my readers' vote of preference and a few remarks.

I have been reading your "Discussions" department, and have noted with surprise the number of people who do not like the stories of H. G. Wells, when, as a matter of fact, there is no writer in the scientifiction field with a more absorbing style, or with more imagination and originality. His tendency to detail and his keenness of observation only testify to the greatness of his marvelous mind. It is my opinion that the people who dislike his work are usually of the kind whose idea of a good story is a hectic melodrama glorifying action—preferably absurd action—and without a single worthwhile thought to commend it to the intelligent reader.

I should like to add a word to the "time travel" discussion which "The Astounding Discoveries of Doctor Mentiroso" and "The Time Machine" seem to have started. The incredible thing about traveling in time seems to me to be the indefinite extension of the span of life of any human being undertaking a time journey. In "The Time Machine," Mr. Wells projects himself so far into the future that he sees the world stationary, with one face always toward the sun. And yet he lives; When, logically, he should have killed himself at the very start by passing the particular period in time when his death would naturally have occurred.

I am twenty-six years of age. I may live to be seventy-six. Let us suppose that a time machine could be invented which would enable me to travel fifty years into the future. I would then be seventy-six. If I traveled farther, I should die and be automatically incapacitated for further travel in time—or space. If my consciousness could live on and continue traveling after the death of my body, it is possible that I could reach that far-distant time of which Wells tells, but I would not then have any such adventures as those of which he tells. Were I, on the other hand, to travel into the past, I could only travel to the extent of twenty-six years. Did I travel farther than that, I should be unborn—non-existent—and again incapable of further travel. If I cut my travels short after, say, twenty years of "pastward" progress, I should undoubtedly see things as they were twenty years ago, but by the same token I should see them with the eyes of a six-year-old child. Is not that self-evident?

However, by all means, continue giving us such stories. Even though they may be impossible, they are tremendously interesting. And do not cut down our rations of Wells. Give us more, if anything.

Such objections as those which Mr. Butler of Taft, California, advances against "The War of the Worlds," seem to me childish. He speaks of the impossibility of slugs or mice developing intelligence, and cites, as proof, the fact that the human race has outstripped such creatures, on earth. If I understand Wells, however, one of the things he most desires to make plain, is that other forms may have developed our own dominant characteristics, mentally speaking, on other worlds: in fact, that this is more likely than not.

John A. Stahlberg,
Outlook, Montana.

[What you say about Time Travel is so well put that it shuts out any criticism by us. No comment seems necessary.

You will have noticed in all of Mr. Wells' stories in which animal life plays a part, that there breathes through it a suggestion of reality or possibility, however extravagant it may appear.—EDITOR.]

A GOOD SEQUEL TO "SMOKE RINGS"

Editor, AMAZING STORIES:

Talk about some of the stories in AMAZING STORIES magazine coming true in the near future. In the February, 1928, issue of the above magazine there was a story entitled, "Smoke Rings," by George McLociard. In this story it mentions the destruction of a dirigible through the aid of these smoke rings. Well, the other day while reading the *Chicago Daily Tribune* I came across the enclosed article. Read it and be convinced. Keep up the good work, let us have plenty of both the short and the serial stories, on the order of "The Second Deluge," and others.

DANES CLAIM INVENTION
TO KNOCK OUT WAR PLANES
(Chicago Tribune Press Service)

COPENHAGEN, Jan. 20.—A sensational Danish invention was revealed today which, it is believed, may eliminate air wars. "The rotating poison gas typhoon," the title of the invention, is claimed, by a special artillery tornado of gas, to be able to be hurled at airplanes, putting them out of commission and rendering the pilots helpless.

H. C. Schmidt, B.Sc.,
Chicago, Ill.

[The alleged Danish invention, to a certain extent, carries out the idea of "Smoke Rings." Smoke rings have been found by experiment to be very wonderful things, and they have even been taken by leading scientists as giving the representation of the atom. But this point of view has been upset by the modern conception of the planetary atom, for the smoke ring has no central nucleus, no representatives of protons, although the ring may, in a way, suggest planetary electrons.—EDITOR.]

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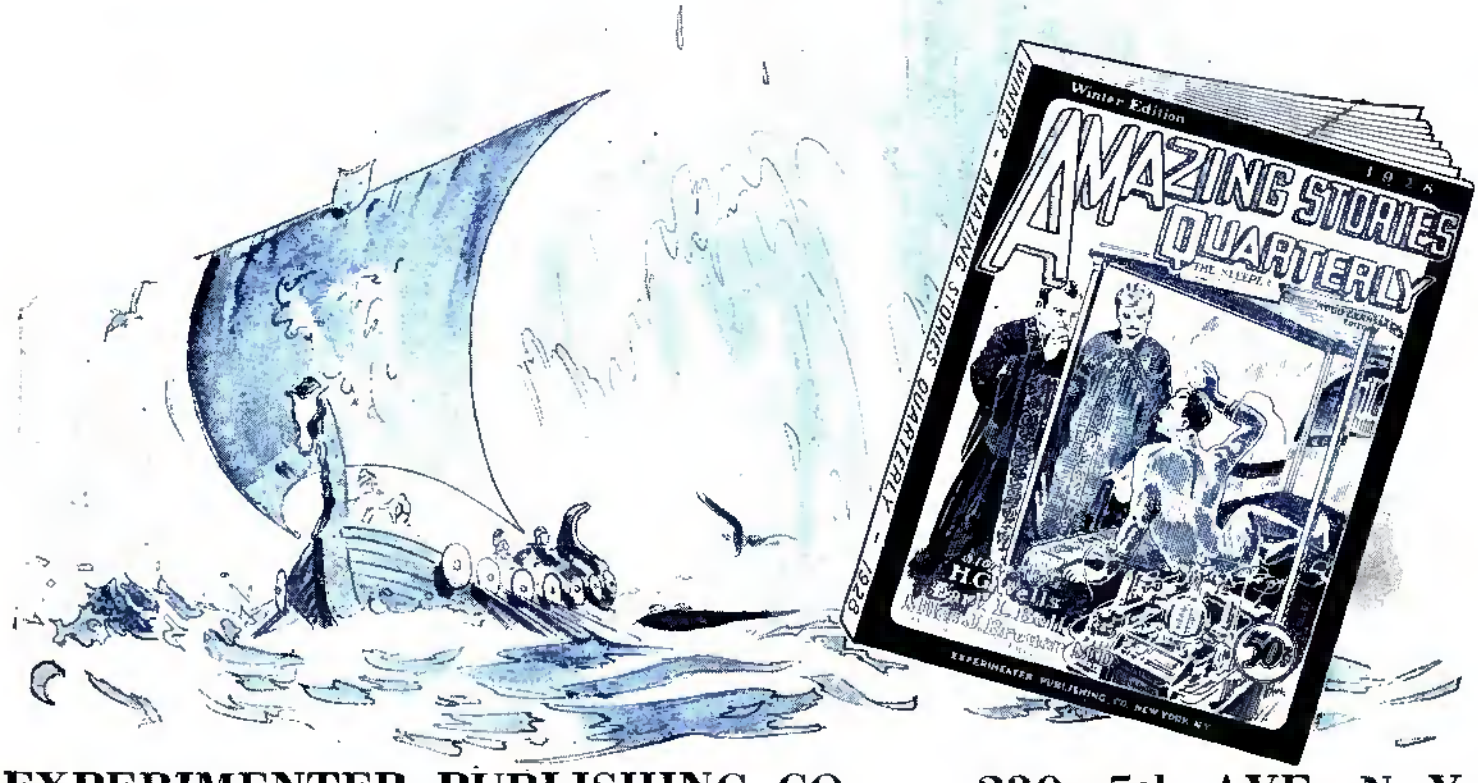

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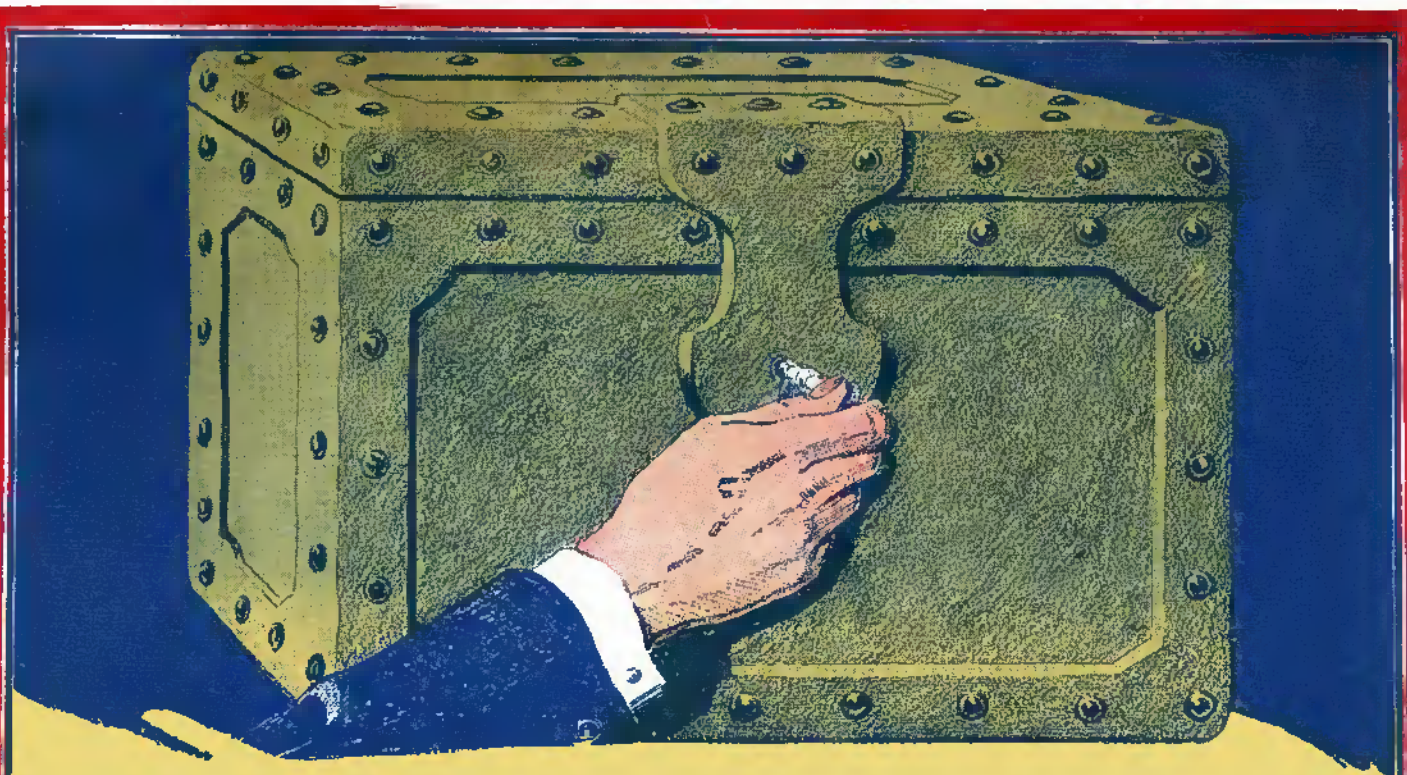

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