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AMAZING STORIES
Quarterly

VOL. 2 JULY 20, 1929 NO. 3

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Our Cover

this issue represents a scene from "Venus Liberated," by Harl Vincent, in which the Tellurians and Venerians are battling on the gallery of the council chamber, with the royalty of the intelligent beings inhabiting the interior of an invisible planet near Venus.

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Amazing Stories
Quarterly

VOL. 2 NO. 3 SUMMER, 1929

ARTHUR H. LYNCH, *Editor-in-Chief*
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C. A. BRANDT, *Literary Editor*

The Future of Scientifiction

By Miles J. Breuer, M.D.

THE outstanding characteristics of every period in human history have been reflected in the literature of that period. Fiction, especially, is more free to concern itself with the everyday life of the common man, than is any other form of literature. In ancient times the hero of the common man was the warrior and the orator, and the epic poem, which is the fictional type of the ancients, contains nothing but war and oratory—unless it be love, which is common to all ages. The fiction of the Middle Ages is distinguished by religion and chivalry; that of early modern times, when men broke out of their narrow corner in Europe and explored the world, is distinguished by adventure and romance. In recent fiction, what do we find as the preponderating element? Industrialism, politics, finance. What men do in real life, they do in books.

Science in fiction is not new. I saw an account of a trip to the moon by one Cyrano de Bergerac, written in the sixteenth century. There must be older examples. But, stories of that type, like Mrs. Shelley's "Frankenstein," were few and far between; and certainly found a limited reading public.

Few men know or care anything about science. The average reader is not a student; he reads the familiar things that come easy.

It is only in recent years that Science has begun to invade the everyday life of the everyday man. Up to yesterday, science was a thing set apart; it dwelt in the sacred laboratories, which none but the initiated few might enter. Who wanted to write about it? Still less did anyone want to read about it? Today, science does for the common man in his daily life more marvelous miracles than the mightiest monarch of old could command. Did Solomon or Cæsar ever ride as luxuriously as does your grocery clerk every Sunday in his Ford? Not only does the humblest of us have in his own home and under his hands such things as the radio, the electric washer, vacuum cleaner, refrigerator, the modern automobile; not only does he daily see such marvels as the airplane, the talking picture in colors, the wonders of surgery, of printing, of the phonograph, of telephony—but new things are constantly coming to remind him of the vast and thrilling possibilities of what is yet to happen.

The average man has ceased to wonder at the miraculous accomplishments of science; it is all a part of his everyday existence.

Not merely the material *impedimenta* of science, but the thought and method of science are becoming part of the life of the people of this nation. The lives and efforts of a constantly increasing percentage of them are becoming involved in science in one way or another. A hundred years ago the proportion of people that came into intimate contact with it was insignificant. Today, who shall say what proportion is constantly occupied in one way or another, directly in the service of our mistress? All the way from the men at the head of great research organizations and teaching in the high institutions of learning, through engineers, medical men, manufacturers, on down to the humble repair man who "services" your radio or "finishes" your kodak prints, science catches the many in her net. All these people live with science, and more or less *for* science. In one way or another they *think* science. Their number is great, and it is constantly and noticeably increasing.

Is it unreasonable, therefore, to predict that an increasingly large part of our country's population will want science served up with their fiction, rather than war or chivalry or exploration? Is it far-fetched to suppose that the fiction-writer's imagination, which, to please the reader, has heretofore exercised itself on the heights of Olympus and in the African jungles, with black magic and the Wild West, will soon for the same reason have to delve into the atom, press out past the confines of the solar system, and deal with intricate apparatus? If war comes next to love in the writings of men, when everyone is occupied with war, will not science come next to love when everybody lives by science and almost everybody works with science?

Scientific fiction as a fine art is truly new. Rarely does any fine art spring fully developed from the brow of its goddess. Years, decades of painful evolution will yet be necessary before Scientifiction can take its seat at the banquet, fully recognized by her sisters, Drama, Historical Romance, the Novel, etc. Scientifiction of today is not yet perfect; and those of us who write it recognize that fact better than does anyone else. When we attempt to wed two such dissimilar personalities as Science and Literary Art, it is but natural that there should be a period of adjustment before conjugal life is perfect. But the point I make is, that progress is being made, *right now*.

AMAZING STORIES is a pioneer. Our Magazine is ineradicably down in history as the leader with the far-flung vision. A hundred or a thousand years in the future, men will point back to it as the originator of a new type of literary art. In the meanwhile, the art is spreading. Scientifiction is gradually creeping into general literature. Old writers are turning their attention to it; new writers are developing. Above all, public interest is increasing.

There is a great, fallow development going on at the present moment. Some day the public will wake up to an intense, conscious interest in Scientifiction. Just as in the past in the realms of war, exploration, or mystery, so it will be in science: man will use fiction to express his pride in the deeds he has done, and his dreams of the things he wants to do and has not yet accomplished.

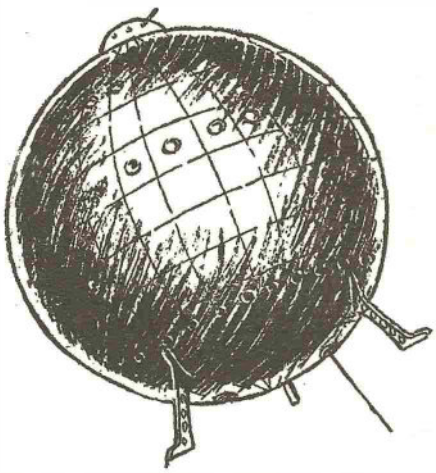
Miles J. Breuer, M.D.
210 Security Mutual Building
Lincoln, Nebraska

(*See page 430*)

Venus Liberated

By Harl Vincent

Author of "The Golden Girl of Munan," "The War of the Planets," etc.



The spherical vessel rose with a jerk, and in a moment was at the entrance to the destroyed air-lock.

WE don't know absolutely that any of the planets are inhabited, yet some of our best scientists are firmly convinced that at least Mars has intelligent beings, and possibly Venus. The lines and ridges that can be seen through the powerful telescopes, seem to be canals built by some intelligent beings, apparently advanced in some fields of science. It is quite possible that telescopes more powerful than our most advanced present-day instruments will be built. Radio is still in its infant stages. Aviation, also, must inevitably make great strides. One or two more inventions that will tend to nullify gravitation and a combination of the perfected inventions and discoveries mentioned before, and conquering the ether for trips to other planets may not be so impossible after all. Mr. Vincent gives us, in a manner not beyond the layman's understanding, mathematical calculations, expert advice, and reasons based on scientific fact, why such results might sometime be achieved. And, basing his story on accepted science, he gives us an excellent picture of what the inhabitants of Venus might really be like and what their life and customs might be like.

CHAPTER I

Psychalgia

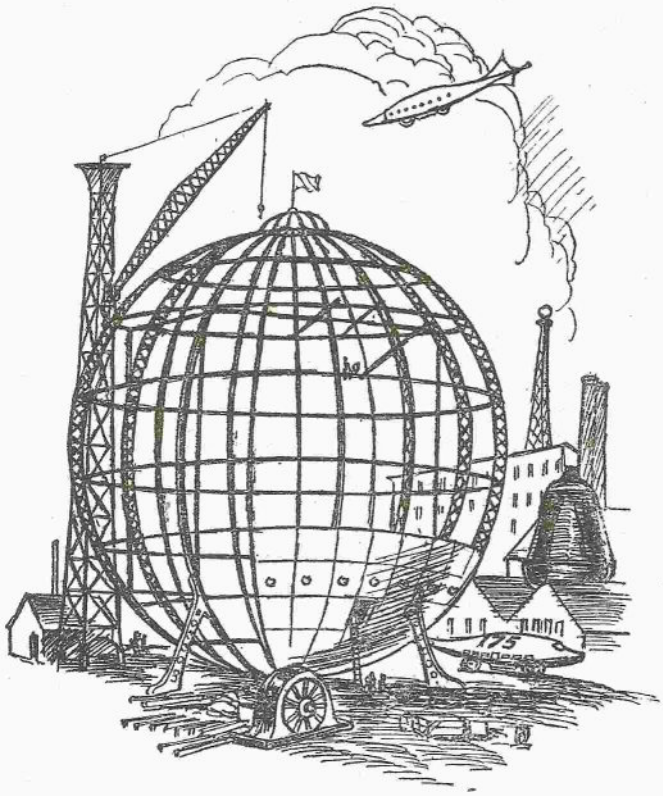
DOCTOR RAMON DEPOLAC, the world-renowned psychiatrist, sat near the open window of his private office on the seventy-seventh floor of the Professional Building. He gazed abstractedly across Central Park, idly considering the maneuvers of the mass of private aerocabs as they jockeyed for position at the huge landing pavilions directly across the park. The doctor meditated on the advance in aviation since Lindbergh's remarkable feat in 1927. Now, less than twenty years later, the world was literally and indeed in the air. All surface travel had ceased. Huge air liners crossed the oceans with safety and despatch. All freight and passenger traffic on land was not on the land but over it—through the now crowded air. And New York, metropolis of the world, wrestled with a traffic problem as great as that with which it had struggled twenty years before on the streets—those multitudinous streets now used only by pedestrians.

He chuckled as he observed a tangle of three small craft that attempted landing simultaneously on the same parking platform. Lucky it was that these modern mechanical birds were absolutely safe from being dashed to the earth, he thought. Fortunate for these frantic mortals that the anti-gravity materials of which their vehicles were constructed saved them from disaster even though the propelling motors became useless through a smash-up. For there were many smash-ups these days in the congested centers.

It was the hour when the pleasure-seekers hastened to the downtown district and the lights of Broadway twinkled an almost irresistible invitation from block after block of tall buildings along the other side of the park. But the doctor was in no mood for submitting to their allure. He was tired and worn, but triumphant as well. His mind was at rest for the first time in many weeks and he gave himself over to relaxation.

With the rush of modern life the demands on the psychiatrist had increased yearly. Human brains, worked to the limit, cracked occasionally and the prevention of mental disease and derangement was now one of the most important problems of medical science. And the profession had responded nobly to the necessity. Few there were in his line who could rank with Doctor DePolac, though thousands all over the world effected marvelous cures by means of the many instruments and methods evolved in his laboratories. And to him the entire medical profession bowed in reverence as it now seemed assured that no human mind would ever again be lost completely. True, in many cases the cure left the abused brain in a different condition than had previously existed, but always a useful mind, useful to its possessor and to society. Sometimes a great engineer, temporarily stunned in mind, would recover from the cure to find that his engineering knowledge had vanished and that in its place there had come an intimate knowledge of some entirely different science. But always it was useful—sometimes of more value than the knowledge it had replaced. Always the mind recovered full memory of human relations and attributes.

To-night the doctor was certain of the success of his most recent experiments and, though fatigued in body, he was jubilant in mind. For many weeks he had worked himself and his corps of experts to the breaking point in the developing of the instrument which was destined to work the greatest wonders of all in the study and cure of mental troubles. The electro-telepathoscope he called this instrument and it had this day proved its ability to open the innermost recesses of the human mind to complete reading and analysis by the diagnostician.



Thousands of steel beams, ready-shaped when received, were welded into a continuous structure that rose quickly to form a spherical cage. Large cross-beams and lattice-like structures, likewise welded into place, formed the floor and wall supports of the numerous rooms of the ship.

His clinics on the several floors he occupied in the building had long since closed, but several internes and assistants still worked in the laboratories. His private secretary also remained at her work in the outer office. Otherwise his establishment was deserted and so quiet was his retreat that he nodded and dozed beside the window. So remote from his office was the scurrying crowd of humanity on Fifth Avenue far beneath him, that not a murmur of it reached his ears. The low hum of the city's activity acted as a soporific. He slept.

IN the outer office Miss Sprague, the doctor's secretary, sighed with relief as she closed her desk and covered the typewriter. Like all members of the force she had been working overtime for many weeks. There was the regular routine work, the typing of patient's record cards, recording the appointments, making out statements, and the filing to occupy her daytime hours. Evenings it was her lot to copy the many notes made during the experiments with the new instrument. Now, with their final completion, Miss Sprague looked forward to a promised two weeks' vacation which she sadly needed.

She took her coat from the rack and stepped to the mirror to adjust the tight-fitting felt hat with which she covered her raven locks. As she prepared for the street and looked about her office to see that all was in order, she was startled by a commotion in the hall. The door burst open and a disheveled young man sprawled through it, landing in an ignominious heap before her astonished eyes. Behind him came Doctor Norris, one of the internes, whose face was convulsed with wrath. The two provided a spectacle which caused little Miss Sprague to voice her merriment in a silvery ripple of laughter.

The young man picked himself up shamefacedly and Miss Sprague stepped between him and the wrathful Norris.

"Why, John!" she said to the interne, "whatever is the matter?"

"This fellow," he sputtered, "came barging through the lab, shouting in a loud voice that he wanted to see Doctor DePolac. He brushed past me as if I was nobody when I told him the doctor couldn't be seen. So I chased him to try and keep him from causing annoyance."

Miss Sprague laughed again. "Let me handle him, please," she said as she turned to the intruder, who was adjusting his disordered cravat. As she looked at him she saw that he was a gentleman, a tall, well-set man of perhaps thirty years of age, with handsome, clean-cut features. But his rather wide-set gray eyes were fixed with the intensity that marked extreme mental distress, and she sobered instantly as she observed this.

"What have you to say for yourself, sir?" she asked.

Doctor Norris mumbled something unintelligible and left the room as the intruder gazed at the smart little feminine figure facing him so valiantly.

"I beg your pardon, Miss," he stammered, "but I simply must see the doctor—to-night. I can't stand another night of it and I know he is the only one who can help me."

The wild look in his eyes frightened the girl. And he was so handsome, she thought.

"What is it that you can't stand for another night?" she asked, still more kindly.

"Dreams—visions. Oh! I can't tell you. It's terrible and I shall lose my mind. I must see him. Take me to him, please."

The young man was babbling—incoherent, and Miss Sprague was genuinely alarmed. She knew that the doctor would respond, tired as he was, were he to get one look at this patient.

"All right, I'll see what I can do," she said. "Now you sit right here in this easy chair while I go in and tell the doctor you're here."

She motioned the strange caller to a seat and he seemed to calm down as he sank into its depths. Miss Sprague quietly opened the door to the inner office and stepped inside, where she was surprised to find the lights unlit and the doctor asleep. As she snapped the switch, flooding the room with soft light, the doctor sat erect with a start. He was a light sleeper.

"What is it, Miss Sprague?" he asked.

"Why, Doctor," she replied, "there is a case outside that looks like an emergency to me. A fine-appearing young man who is quite evidently under a severe mental strain —psychalgia. He insists upon seeing you."

The great physician sighed. "Well, if it is as bad as you say I guess I shall have to see him. Show him into consulting room number three and I'll be there directly."

Miss Sprague tripped into the outer office and led the young man to the consulting room with a light heart. He smiled his thanks as she left him at the door and sped for the elevator. At last she was on her way home.

RALPH PRESCOTT seated himself in a restfully lighted room, whose walls were lined with queer contrivances and mechanisms. To him it was all very strange but he calmed his mind and found his nervous tension abating as he realized that he was to see the great specialist after all. He had not long to wait, and he arose from his chair respectfully as Doctor DePolac entered the room. The pleasant round face with the Vandyke beard and the great kind eyes peering from behind horn-rim spectacles were well known to him from the many appearances of his photograph in the newspapers.

"Doctor DePolac, I believe?" he asked politely.

"Yes. And you wished to see me?"

"Greatly, Doctor. I am almost frantic with worry."

Well, now let us find out what your trouble is," said the doctor, looking at him keenly. "Kindly step to this small table and sit across from me."

He lighted a small, orange-tinted light which he adjusted so that its beams fell directly on the face of his patient, then sat across from him, watching his eyes intently as he talked. On the surface of the small table he placed a bright metal disc and requested Ralph to focus his eyes on the shining object.

"Now, young man," he said, "just keep your eyes on this little disc and rid your mind of all worries. Concentrate on the cause of your trouble or the thing which you think is the cause of it, but free your mind of all fear in the matter. Then tell me everything. Hold back nothing and I promise I can help you. But first you must tell me who you are, your business, and your residence address."

Ralph found himself immediately restored to confidence and the little glimmering disc played queer pranks with his eyes. It soothed him and loosened his tongue. He was conscious of the doctor's close scrutiny as he talked.

"I am Ralph Prescott," he began, "son of Oliver Prescott, the department-store man. Since father's death two years ago I have been managing his business. My home in the city is at the Hotel Easterly."

"Oh, yes," the doctor broke in, "I knew your father some years ago when you were a little shaver. Now I feel acquainted. But continue. Start at the beginning and tell me all about it."

"It began about three weeks ago, Doctor," he said, "one night when I had returned to my rooms from a social affair. It was about two o'clock in the morning and I was very tired. Not under the influence of liquor, you understand. I never touch it. I retired immediately and fell asleep as soon as my head touched the pillow. But I had not slept more than a few minutes when I was awakened by an unexplainable sensation. My entire body tingled as from an electric shock. Instantly every sense was alert and I sat up among the covers, with eyes open.

"My first startled impression was that I had forgotten to turn off the bath-room light when I retired, but I saw at once that the faint light which permeated the room was of a peculiar color. A dim, wavering green radiance seemed to emanate from nowhere in particular and flickered and swayed about each object in sight. I scrambled from the bed and pinched myself to see if I was really awake. As I stood erect the tingling sensation increased and I found my body enveloped in a swirling green mist which momentarily increased in brilliancy. My vision became blurred, objects became distorted, and I rushed to my dresser, gazing into the mirror in disbelief. The eerie green radiance bathed my figure from head to foot, apparently emanating from my body in leaping, twisting streamers like angry flames. My hair stood out from my scalp like a mass of tiny, writhing tentacles, straining to tear itself away. The tingling of my skin grew to a burning, and soon permeated my whole body. I could feel the very blood in my veins coursing more rapidly and with the searing awfulness of some inhuman liquid fire. My breath came in panting gasps.

"The green mists held weird creatures, part human, part uncanny winged beasts. These figures floated with the vivid, expanding clouds, reaching for my helpless figure in their midst. I was rooted to the spot, held by some terrible, invisible power. My eyes looked afar into some unspeakable realm where horror held sway. Leering faces, like gargoyles, peered maliciously into my immovable pupils. In the distance, seemingly many miles away, some intangible figure stretched forth its arms, controlling with slow and majestic movements of its hands the motions of the horrid creatures and of the leaping, eddying mists. Voices muttered and whispered in my ears. Soft, flabby hands pawed at my clothes, felt of my fingers and wrists, slithered clammily over my face and neck. In the dim distance the huge but indistinct commanding figure beckoned with both hands, arose to full

height and vanished into the blackness from which it had appeared.

"The tiny, fluttering creatures of the mists clutched me on all sides. There seemed to be hundreds of them and they lifted my rigid body with ease. The drifting mists became even brighter than before, whirled and stretched out into weaving ribbons, which tugged and strained to be gone. Something seemed to give way, and with a tremendous rush through screaming winds, I found myself propelled into space. With the fiendish laughter of my captors ringing in my ears, I lost all consciousness of sight and sound.

"But the sensation of motion persisted, incredibly swift, sickening, gliding. The course of my helpless body seemed to be that of a projectile, a huge arc. Now I was over the highest point, falling ever faster. The descent became steeper, still speedier, and I soon realized that I was falling vertically with breath-taking acceleration into some fathomless, soundless abyss. Tearing strains in my tortured body told me that in some unaccountable way I was passing through solid earth, rock strata, fiery molten pools, to the heart of the earth. Mercifully, my consciousness deserted me."

As he finished this recital he leaned back in his chair with eyes closed as if to shut out the horrible sight.

"And when you recovered consciousness?" the doctor asked gently.

Ralph leaned forward again and once more fixed his eyes on the little bright disc before him.

"DOCTOR," he said solemnly, "when I recovered I was in a heap on the floor of my bedroom. The sun streamed through the windows and I felt remarkably well and refreshed. I put the experience down as a horrible nightmare, probably induced by something I had eaten the night before. But this was only the first time."

"So the same thing has been recurring frequently?" the doctor asked him.

"Yes and no. The experience varies but it always starts with the green vapors with their horrible creatures struggling to get me to their far-away realm. Sometimes it seems that I have reached it—that they have at last had their way with me. But always I lose consciousness before the final realization and awake later to find myself alive and well. This has happened no less than ten times during the past three weeks and it has brought me to the condition in which you now see me."

Again his fine eyes took on the wild look, as the shimmering disc before him momentarily lost its power.

Very gently the doctor pressed his cool finger tips against Ralph's throbbing temples. "Now tell me," he said, "to what further depths does the experience lead you from time to time."

"It is more or less indistinct, of course, but on each occasion I seem to approach more closely to the commanding figure. Last night I was so close I could have touched her if I had not lost consciousness at the precise instant."

"Oh, then the figure is that of a woman?" asked the doctor.

"Yes. And a strangely beautiful one, though of huge proportions. She seems to be demanding that I accompany her somewhere, but not once have I been able to understand her commands. She smiles and beckons at times. At other times she frowns and commands. But I do not comprehend. And now I fear that the next attempt will be successful—that some horrible fate is to overtake me."

"Do these hallucinations always come to you during the night?"

"No, Doctor. Twice it came upon me during my waking hours, but the sensation both times were similar, although, as I mentioned before, they are progressively obtaining a more certain influence over me."

"Have you lost weight, Mr. Prescott?"

"Not more than five pounds, and that is probably because of my inability to eat regularly through sheer worry. The fear of it is ever with me and it has come to the point where I am no longer able to attend to my business. Understand, I am far from being a physical or moral coward. But this thing has undermined my will; it is like an insidious poison. And, strangely enough, though each individual experience is horrible and terrifying in the extreme, I am calmed and reassured when I reach the presence of that great commanding figure. A strange peace seems to come over me just as I lose consciousness. The fear comes afterwards. It seems always that the queenly figure expresses disappointment or rage at her failure to accomplish something, but at the time it does not seem to me that she wishes me harm. I can't explain it."

"Does your work involve extreme mental overwork?" was the doctor's next question.

"No. It is merely the work of the average executive. We now have but three of the large stores and I have an extremely capable force of assistants."

"Have you ever been subject to spells of despondence, or ever worried considerably over any matter?"

"No," was Ralph's reply. "In fact, I have often been considered too carefree by some of my associates, rather devil-may-care, if anything."

The doctor mused. "It is an unusual case," he stated. "And I can hardly believe that it is either psychosis or neurosis. It seems as though you might actually be subjected to some outside mental influence. But—we shall see."

He led Ralph to a corner of the room where there was the conventional X-ray equipment with a fluoroscope screen. The doctor donned apron and gloves of lead and requested Ralph to stand between the tube and the screen. With the adjustments made, he turned a switch and the purr of a small motor-generator responded. Manipulation of another switch started a crackling noise that told Ralph of the functioning of the apparatus. But he was behind the screen and could not see what was exposed to the doctor's view on its face.

ON the screen there appeared in strong outline the bony structure of Ralph's head. The brain cavity itself showed blank, as the penetration of the rays showed only the skull itself in detail. But the doctor reached for a small instrument which, when adjusted, emitted an intense beam of red light, a tiny beam no larger than a pencil. This pencil of light he directed at the image on the fluoroscopic screen and as he did so, each point at which it was directed showed distinctly the convolutions of the gray matter within the small area of its influence. Carefully the doctor covered each portion of the brain with the little beam. From time to time he asked Ralph to turn his head this way or that so as to be able to reach various portions of cerebrum or cerebellum. Eventually he turned off the power and looked thoughtfully at his patient.

"Suppose we retire to my office and talk this thing over," he suggested.

Ralph followed the great man into his private sanctum and soon found himself seated comfortably and facing the doctor, who still frowned in perplexity.

"Well, what's the verdict, Doctor?" he asked anxiously.

"Mr. Prescott, there is absolutely nothing wrong with that brain of yours. It is a perfectly healthy organ and shows no evidence of the strain you are undergoing. I can but conclude that you are the unfortunate victim of a stronger will than your own. Someone is using you as a telepathic subject, though the purpose seems incomprehensible. The manifestations are entirely foreign in

nature to those usually encountered in such cases. But I have a proposition to make to you. The case is of extreme interest to me—to my profession—and I should like to follow it through. Could you arrange to remain in my establishment for a few days and submit to observation?"

"Yes, indeed, Doctor," was the ready reply. "I will do anything you wish. I am absolutely desperate over the matter and will do all I can to aid in your diagnosis and cure. I have complete confidence in your ability to bring relief to me."

"What I have in mind," said the doctor, "is to keep you under observation until such time as you have a recurrence of the visions and I, through the medium of an instrument I have recently invented, can share the experience with you. By observing directly the impressions recorded by your brain, my assistants and I should be able to analyze the thing and reach some conclusion."

"Can it be done?" asked Ralph, in amazement.

"It has been possible only during the past few days," replied the doctor. "We are now in a position to read a man's innermost thoughts—actually to project on a screen the brain-pictures existing in either the conscious or the sub-conscious mind. I expect the discovery to be of extreme value to the scientific world, in fact to the entire population of our earth."

"I should think it might well be so, though I do not know much about such matters," said Ralph. "On the other hand, might it not also be used by unscrupulous persons to effect great damage?"

"Yes," smiled the doctor, "but it shall never leave the hands of the medical profession. I intend to see to it that the discovery is kept strictly under government control. And now, if you are agreeable, we can arrange for your coming here."

"The sooner the better," was the instant reply.

"To-night?"

"Yes. I can remain now if you will allow me to telephone my hotel for clothing."

"Fine," remarked the doctor, rubbing his hands. "As soon as you talk with your man I shall show you to your room here."

The doctor had completely forgotten his physical exhaustion and was as alert as a sparrow. His eyes beamed delightedly behind their thick lenses as he rang for an assistant.

Ralph soon completed his instruction to his valet and followed the doctor and the newly-arrived, white-coated interne into a bare, white-walled bedroom. This was a typical hospital room and contained nothing out of the ordinary to arouse Ralph's curiosity. He disrobed as he was requested to do and, as he crept beneath the sheets, felt more peaceful in mind than he had for many nights past. The two doctors left the room but soon returned with their arms full of complicated apparatus.

The interne arranged on a nearby table an instrument not unlike a radio television set, but bristling with gauges and meters. By means of a short length of cable this was attached to a wall plug. Another length of cable led to a cap, strangely resembling a football player's helmet, which Doctor DePolac fitted over Ralph's head.

"This is the invention of which I spoke," said the doctor. "The viewing and recording apparatus is in an adjoining room and there we shall be on constant watch for your metal reactions, asleep or awake. Try to sleep, Mr. Prescott, and have no fear of the result of our experiment. If there is anything you desire, press the button at the head of your bed and your nurse will respond."

Ralph smiled assent and composed himself for sleep as the doctor turned off the light and bid him good-night. The door was closed softly and it was not long before Morpheus claimed the harassed young man for his own.

CHAPTER II

Theodore Crowley

ON the west bank of the Delaware river, a few miles south of the great city of Philadelphia, sprawled the factory buildings of the Sorenson Aircraft Corporation. By day and night the sound of intense activity could be heard from within. The steady thump-thump of the ten-ton drop hammers mingled with the rapid fire tattoo of the smaller steam hammers. Occasional bursts of light from the foundry apprised night watchers that a pouring was in progress. The rumble of great cranes making their rapid way along the rails which lined the walls of each main aisle frequently drowned out the murmur of the many lathes, boring mills, and automatic screw machines. And when, at each change in shifts, the milling mass of humanity that was its army of skilled labor, belched forth to the waiting interurban air liners that bore the thousands of employees to their homes, the confusion was indescribable.

During the ten years since his graduation from college Theodore Crowley, more familiarly known as Teddy, had spent his every waking hour within the confines of the high fence which enclosed this factory. His was the energy of complete absorption in his work and it was by his indefatigable efforts in the research laboratory that he had eventually risen to the office and title of Consulting Mechanical Engineer for the corporation. It was a position which gave him great influence in all activities of his organization and would have given him much leisure had he permitted himself to take it. But Teddy was one of those not uncommon specimens among the engineering profession, who could not rest until he had completed any job he started, and it seemed that one job followed another so rapidly that there were always no less than three in progress. Just now his force was engaged in a series of tests which, to him, were of immense importance. His enthusiasm over the seeming trend of the results was boundless.

Teddy was one of those tall, lean mortals who seemed to be tireless. His face was always clean-shaven and, though not more than thirty-four in years, most of his once thick blond hair had disappeared, giving his narrow face the appearance of even greater length and solemnity. His steady blue eyes looked out from beneath bushy brows with an eager, questioning intensity and the angle of his tapering chin told of an indomitable will. His nervous temperament was betrayed by his constantly moving hands. Those long, powerful fingers could not rest, and were continually straying from his watch-chain to his slide-rule or to any other article that happened to be within reach.

To-day he was disgruntled as he sat across the mahogany desk from John Sorenson, the president of the concern. Sorenson was speaking rapidly, forcefully, and Teddy toyed with the cord of his desk telephone as he listened.

"I tell you, Crowley," spoke his superior, "this last test of yours has cost the Company more money than it will ever be worth. What are you driving at anyway? It is time that you took us into your confidence."

"It is going to be a success," replied Teddy doggedly, "and I do wish you would trust me a little longer. Have I not always produced results?"

"Yes," the president admitted grudgingly, "but we are not in the habit of spending thousands of dollars on experiments along lines of which we do not know the purpose. Here you have had the metallurgical department, the foundry, and your own force working overtime for more than a month. You have spent over eighteen thousand dollars of the Company's money. And, for what? You have evaded me every time I questioned you on the matter."

TEDDY'S long fingers strayed nervously to the lapel of his coat. He seemed undecided as to how to reply. Silent for a moment, he suddenly struck the table with clenched fist.

"Mr. Sorenson, I have been wrong," he snapped out, "but this thing is so vital that I have not dared confide in anyone. I can see now that I should have taken you in my confidence and I sincerely apologize."

"Ah, that is better," said the big man opposite him. "I thought it was somewhat outside your usual procedure. Now let's hear about it."

He leaned back in his chair, puffing vigorously at a fat black cigar. Teddy became more at ease. He lowered his voice as he spoke.

"I am almost certain that our competitors have men planted in our organization with the express intention of stealing any of our secret formulæ and ideas that they can get hold of. In fact I have spotted two of these men already and that is the reason I have been proceeding with extreme caution. The thing I am working on at the present time must be kept an absolute secret, and not a man in the shops except myself has the slightest inkling of what it is all about."

Sorenson grunted his anger at the news of commercial spies in his plant. "Go ahead, Crowley," he said.

"To begin with," said Teddy, "you will have to admit that the discovery of the properties of super-silicon steel by our research department was responsible for our remarkable growth, for our advantage over competition, and for the making of a lot of money for the stockholders."

"Discovery by yourself, you mean," stated Sorenson. "Yes it was. And our royalties on the use of your invention have made a great many of us rich."

"As you know," continued the engineer, "the safety of modern aviation is absolutely dependent on the use of this super-silicon steel, energized by our secret process in order to overcome the effect of gravity. As you also know, the energizing process is not permanent and it is necessary for all our competitors to rely upon us for re-energizing the material we originally sold them. No doubt it is primarily this secret they are trying to learn by their underhanded methods. But I think we have it well guarded.

"So far, so good. But, did you ever stop to think that the energized metal is still far from perfect—that the effect of gravity is not completely overcome, even at the surface of the earth? This is of little importance in commercial aviation since we do not need to overcome the attraction of the earth completely. But as a scientific conquest of one of the most mysterious forces of nature, our metal is a distinct failure."

"Why, what do you mean?" asked Sorenson.

"Just this. From our experimental data you will remember that at one foot above the surface of the earth, the effect of gravity is nullified approximately ninety-nine percent. Thus a vessel weighing ten thousand pounds under the full effect of gravity actually weighs only one hundred pounds when lightened by the use of our energized material. It is thus impossible for the vessel to rise from the surface without utilizing the energy of its powerful Diesel motor. This is sufficient nullification for aircraft, of course, since the ratio of decreasing effect is not great enough to get us into any danger at reasonable altitudes. At ten thousand feet the effect is still over ninety percent and the vessel does not weigh more than a thousand pounds, which weight is still easily carried by the powerful motor. And, if the motor fails and the machine falls, it is quite safe since there is no acceleration. It merely floats gently to the earth on account of the increasing counteraction of gravity as it approaches the surface. At the ground the nullification is within one-tenth of one percent complete, so the vessel weighs only ten pounds as it alights and the resulting shock is imperceptible.

"All of this is old stuff to you, Mr. Sorenson, but it brings me to my point. Suppose we could counteract gravity completely, regardless of distance from the earth? Suppose we could even reverse its effect—literally cause a body to fall upward with accelerating speed?"

The president gasped. "Do you mean to sit there and tell me you can actually accomplish this miracle?" he asked.

"I am practically certain of it," was the reply, "and should be able to prove it later in the day. My men are now assembling a metal sphere about two feet in diameter, the purpose of which is entirely unknown to them. The internal mechanism was constructed piecemeal in four different parts of the shop. The several sections of the shell were made in the tool room and assembled in the propeller shop, by special men working under my personal direction. There is not the slightest possibility that a single man outside of myself has an inkling of the use for which the complete apparatus is intended. I have been questioned by my most trusted men but have not given them even a clue. The sphere should be ready before dark and I intend to make the final test myself. Would you care to accompany me?"

"Most certainly," answered his superior, "and what will be the nature of this test?"

Teddy grinned enigmatically. "Better wait until the time comes, Mr. Sorenson. But, if my calculations and previous test results are correct, you are due for a great surprise," he said, as he arose from his chair.

"Well go ahead," said the president, "but I am going to be very impatient, so be sure and keep me advised as to your plans."

"You bet," said Teddy, and he hurried from the office.

President Sorenson sat in deep thought for a few minutes after this. He congratulated himself on being the employer of one of the most talented engineers in the world. Without this young man his vast fortune would never have been built. And, then and there, he made up his mind that Theodore Crowley should be richly rewarded, whatever the outcome of his latest experiment.

TEDDY hurried from the office building and strode rapidly along the cinder path that led to the research laboratory. He was troubled in mind, for it was not clear to him what course to pursue in the remainder of the experiment. He felt assured that Sorenson would appreciate the value of his new invention, yet he hesitated to unburden himself completely to the head of the great organization. For Sorenson had acquired a reputation as a hard man at driving bargains and Teddy feared for the future of his discovery if he placed it in the hands of the corporation. The details of construction and certain metallurgical secrets, however, were locked in his brain and he felt that he could, if necessary, keep them inviolate, though it might mean the cost of his excellent position.

He entered the laboratory building and proceeded at once to the gallery where his newest pet was being assembled. Here three of his best men were busily engaged in fitting and adjusting the various portions of the mechanism. His foreman, Steve Gillette by name, approached him when he entered the enclosure that had been erected to ward off prying eyes.

"Boss," Steve whispered, drawing him to one side, "there have been about seven different workmen hanging around here most of the day. Every few minutes some hunky comes busting in with a wild yarn about wanting to get some special tool that he left here day before yesterday, or something like that. And every mother's son of them has tried to hang around and get a look at this machine we are putting together. I'm some curious my-

The apparatus would be ready sooner than he had anticipated, and it appeared that his men had done their work well.

self, but these guys seem to be a whole lot more so. What do you make of it?"

"Just a natural curiosity, I guess," Teddy answered evasively, "but what have you been doing about it?"

"Had a couple of them fired," replied the foreman, "and I got the super to send the rest of them down to the city on cooked-up errands. Guess we won't have any more trouble."

"That's good, Steve. And now, let me see how you are getting along."

The foreman led him to a cradle wherein there reposed a spherical framework of metal which contained an amazingly intricate assemblage of machinery. The other two workmen were cutting and fitting to the skeleton framework the many curved sections of bright metal which were to form its covering. Teddy watched in silence as the work progressed. Occasionally he gave a word of advice or tightened a screw here and there himself. He was greatly satisfied with the results thus far. The apparatus would be ready sooner than he had anticipated and it appeared that his men had done their work well. Within the hour the last screw had been tightened and all that remained to be done was to fit the circular hand-hole cover plate that provided access to the interior of the bright spherical machine. He stepped to the telephone and called Sorenson, advising him to come to their section of the shop.

When the hand-hole cover had been fitted and clamped home, Steve looked at his superior with a twinkle in his eye.

"Well, Boss," he asked, "now that you've got it, what are you going to do with it?"

"I am going to take it away to play with myself," answered Teddy, "and you fellows will never see it again. But I want to thank you all three for the good work you have done and to tell you that you will all find a little boost in your pay envelopes from this week on."

He was thanked by the mechanics but he could not help seeing that they were puzzled by the mechanism they had just assembled as well as by his extreme secrecy in the matter. They withdrew respectfully when Sorenson himself appeared on the scene.

"This is the object under discussion," Teddy told the president, pointing to the glistening sphere, "and the remainder of the experiment will be conducted in my own home. Can you leave the Works now?"

"Yes, indeed," was the reply. "Let's be on our way."

The sphere was loaded onto a small truck and trundled out to the landing field where the private aerocabs of the executives were parked during working hours. Into one of these small vehicles the workmen loaded the sphere, which proved extremely awkward to handle on account of its shape. Sorenson and Teddy seated themselves in the machine and with a sudden whirr of the powerful propellers they soared into the air. The three mechanics watched the craft disappear towards the southwest, and shrugged their shoulders resignedly as they returned to their normal tasks.

IN a few minutes Teddy's small craft had landed in his own yard. This little house had been the engineer's pride for several years, though he had no family to share it with him. But with the able ministration of his Japanese servant, he had found a great measure of comfort there after his work at the factory.

"How on earth are we to get that heavy ball into your place?" asked Sorenson.

"Very easily," grinned Teddy. "Watch."

He knelt beside his brain-child lovingly and disengaged the clamps of the hand-hole cover. Then he reached inside the sphere and manipulated some hidden control. There was a gentle humming from within and, within a few seconds, he easily lifted the contrivance by inserting a crooked finger through the small ring which had been provided at the top of the sphere.

"It weighs only a few ounces now, you see," he said triumphantly, "though it weighs one hundred and fifty pounds when it is not energized."

Sorenson gazed in wonder and followed his host as he carried his slight burden down the back steps to the cellar. Teddy grinned at his amazement.

"You haven't seen the half," he remarked gaily, tossing the gleaming ball in the air and catching it easily in the palm of his hand. "But I will not keep you in the darkness much longer, Mr. Sorenson. I should explain.

"You understand, of course, that this small sphere is but a model. But it serves to prove the accomplishment of that which I have been striving for. The shell of this ball is composed of our ordinary super-silicon steel but, instead of energizing it semi-permanently as we do in the case of the standard air craft, I energize the metal from the mechanism in the interior. Thus we can lighten or decrease the weight of the body at will and to varying degrees. In fact I have calculated that the energizing force can be increased to such a degree that not only can the force of gravity be entirely neutralized but actually reversed. I now expect to prove this to your satisfaction."

He led his visitor to a corner of the cellar which had been fitted up as a workshop. On the floor there reposed a platform scale of the spring balance type and, directly over it and bolted to the ceiling beams was a duplicate scale in an inverted position with its platform directly above the one on the floor. Teddy placed the sphere, with its mechanism still humming, on the lower platform. The pointer barely moved against the dial, showing that the weight of the ball was negligible. He again reached into the interior of the sphere and the whine of the mechanism slowly decreased in pitch as some rotating element within started to slow down.

"Watch the dial," said Teddy, springing to his feet.

As the sound from the sphere grew lower and lower in tone the pointer turned steadily to the right until, when the mechanism had completely stopped, it indicated exactly one hundred and fifty-six pounds. Sorenson was speechless as he watched.

"Now watch the reversal," said Teddy gleefully.

He again started the mechanism and as it gained speed the pointer of the scale gradually indicated less and less weight until it finally rested at zero. Then Teddy steadied the sphere with his hands as the whine of the machinery within continued in an ever-rising crescendo. Slowly, smoothly, the strange machine rose until it rested against the platform of the inverted scale above. Then the two men stood spellbound as the pointer of this scale left the zero point and started to register increased pressure as had the first. Steadily it mounted as the motor in the sphere turned faster and faster. Finally it rested at one hundred and fifty-two pounds when the motor had attained constant speed. The sphere weighed exactly one hundred and fifty-two pounds less than nothing.

"Four pounds losses," muttered the engineer. "Only about two and a half percent. Just about what I calculated."

He turned to Sorenson triumphantly and found that gentleman gazing at the sphere and the upper scales with eyes that could not believe, yet dared not disbelieve.

"Why—why man alive," stammered the amazed executive, "you have done something wonderful here."

"I know it," said Teddy complacently. "Now do you see why I wanted it kept secret?"

"I should say so. And it must be covered by patents at once. I promise you, my boy, that the company will pay you no less than a million for this invention even though you did accomplish it on our time and with our money. I will ram it down the throats of the directors without the least compunction."

He grasped Teddy's hands and capered like a schoolboy.

At that moment there was the sound of a scuffle outside the cellar window and the two startled men ran into the open air to find that Hirobumi, the Japanese servant, had captured a prowler. By a trick of jiu-jitsu he had the man's hands pinioned behind him and the face they gazed at was contorted in agony. It was one of the men from Section K of the shop, spying on their activities. Luckily the little Jap had caught him before he had been able to see anything of value and it did not take long for Teddy to turn the prowler over to the police.

The two men talked very seriously after the excitement was over and Sorenson was greatly concerned over the safety of the invention.

"Why, Teddy," he said nervously, "that sphere is not safe here. In fact I can't think where it would be safe. What shall we do about it."

"Well," was the measured reply, "I guess we had better get rid of it. That is the best way and it is no longer of value as it has proved my calculations. All details are in my mind so its loss will mean nothing."

They again descended the cellar steps and Teddy slowed the mechanism down to the point where the weight of the sphere was practically nothing, when he carried it to the open air. He reached inside and manipulated the control, then hastily clamped the hand-hole cover home. The sphere hung in mid-air for a moment, then started to rise. Faster and faster it sped upward until soon it was lost to view against the clear blue sky. The Jap gazed open-mouthed at this exhibition of magic.

"There goes eighteen thousand dollars," was Teddy's only remark.

Sorenson said nothing.

CHAPTER III

Professor Timken

ON a hill in a beautiful section of eastern Pennsylvania stands the observatory of Strathmore College. Twenty years ago its twenty-four inch refractor had been considered one of the finest telescopes of its type in the United States, though at that time there did exist several larger ones, notably among these the forty-inch refractor at Yerkes observatory. Of course there were the reflectors, including one of one hundred inch size at Mount Wilson, and these had greater light-collecting powers. But the twenty-four inch glass had contributed greatly in the photographic work then being carried on by astronomers all over the world, and it was still a good glass, at least in the opinion of Professor Timken. He loved it like a child for he had practically grown up with it. All through his college days he had loved to admire it and he spent most of his spare hours in the dome room, even though he might be allowed only to watch. An occasional glimpse of the heavens through its thirty-six feet of length was a thrill to be remembered for days. Then after his graduation and the obtaining of further degrees he had returned to Strathmore as a full-fledged professor and was soon put in charge of astronomical work. From then on that twenty-four inch glass was his constant companion.

With the success of the two hundred inch reflector on which work was started as far back as 1928, the reflecting type of instrument came more and more into vogue. And now, right beside his beloved refractor, there reared another and larger dome-topped building. This housed an almost completed reflector, whose mirror measured more than thirty feet in diameter. The professor resented the coming of the new giant with every fibre of his being—jealousy it was, for he knew that his old love was to be cast into the discard. He knew it would not be entirely discarded, of course, for it would always be used for purposes of instruction. But it was more or less antiquated and would become more of a curiosity than anything else with so great an instrument alongside it.

Scarcely fifty-five years of age, the professor was a man with snowy white hair and beard, which made him seem a considerably older man. But he was strong and rugged and had made a reputation for himself that was unsurpassed among his confrères. And his contributions to science were many and authoritative.

To-night he sat gloomily at his desk, unable to work. He stared dreamily at an illuminated photograph of the latest solar eclipse. This photograph had been made with the great reflector at Buenos Aires and showed the black disc of the moon fully eighteen inches in diameter. The corona was especially vivid and several prominences showed their flaming contours past the obscuring black disc of the earth's satellite. Two hundred thousand miles in height, the greatest of these measured.

Professor Timken was a dreamer and often speculated on the possibility of the existence of life on the other planets. It was thus not strange that his mind should take this turn on this particular evening. But it was a coincidence, that at this moment John Sorenson and Teddy Crowley should be mounting the steps to the observatory. He was startled from his reverie by their ring and hurried to the door.

"Why, bless my soul, Teddy Crowley," he exclaimed delightedly as he took the young man's hand. "What brings you here to-night? I haven't seen you in nearly two years."

"I know you haven't, Professor," said Teddy, "and I am ashamed of myself too. But I have been so very busy at the shop that I have scarcely had time to do anything outside. I should like you to meet Mr. Sorenson, the president of my company."

"I have heard of you, Sir," said the professor gravely as he took Sorenson's outstretched hand, "and I am extremely glad to make your acquaintance."

"I can say the same on both counts," was Sorenson's hearty response, "and I hope we are not intruding in thus calling on you so unexpectedly."

"Not at all," said the professor, "I am always glad of

visitors on a night like this. The atmosphere you know. After a quick change of barometer such as we experienced to-day, the changing air currents make it impossible to do any work with a telescope. The stars just flutter all over the field of vision."

HE led them past the ancient radio which was still used for checking up with Arlington time signals, the antiquated box with its three honeycomb coils projecting from it at crazy angles. Sorenson was very much interested as he stepped into the office and at the professor's invitation seated himself. His eyes roved from picture to picture and finally rested on the one of the eclipse. All this was new to him, as he had never before visited an astronomical observatory. But to Teddy it was quite familiar. He had taken his course in this very place under Professor Timken and had visited him many times during the ensuing years.

"What can I do for you, my boy?" the professor asked of Teddy.

"I don't just know—as yet," said Teddy. "But I should like to have a talk with you if you have the time to listen. And I am sure you will be interested in the latest discovery made at our plant."

"All the time in the world, Son. And I am more than glad to see you—to-night especially. I had a little attack of the blues just before you came. That is very unusual for me."

Teddy asked a sudden question, "What would you say, Professor, if I were to tell you that we have succeeded in completely neutralizing gravity; that we have, in fact, succeeded in reversing it to within two and a half percent of entirety?"

"Why, I should say that was very remarkable. Have you actually done this?"

"Positively, Professor. Even now there is rushing into the depths of space a model in spherical form, two feet in diameter and weighing normally one hundred and fifty pounds at the earth's surface."

"You don't say. Well—well—that is surprising news," said the professor, "but I'm not astonished at anything you accomplish, my boy. And I always felt that it would be done."

Sorenson listened to this conversation without interjecting a single remark. He was content to sit with folded hands and take in the words of the two scientific men, his eyes roaming about the room betimes. His was a financial mind and to him there was no romance in science. He only knew that there was money to be made. And he would reward those who helped him make it.

Teddy continued excitedly, "Do you realize what this means, Professor? Do you realize that we can now construct a ship that is capable of traveling through outer space—to the moon—to Mars—to the edge of the universe, if necessary?"

"Of course I realize it. But, naturally, there are other difficulties to be overcome besides that of gravity. As I see it, this gives you only your propelling force. Your ship must be very carefully constructed and equipped if it is to be safe for the occupancy of human beings in traveling through the intense cold and the vacuum of outer space."

"Naturally," agreed Teddy, "and that is just why we are visiting you. We may want your help. Mr. Sorenson has agreed to appropriate three million dollars for construction of the first vessel and a portion of our plant will be devoted to this work. But he has some doubts as to the practical value of such a contrivance and of its money-making possibilities."

"Why, the thing is stupendous—incredible," the professor interrupted. "Certainly there is money in it. For centuries it has been the desire of man to leave his own earth and visit the other planets. Once this becomes feasible almost anything might happen. First of all there will be scientific expeditions of exploration. These can easily obtain backing from foundations and from wealthy men interested in science. Then, after numbers of such voyages have been made and word comes back to our earth of the wonders of the other worlds, of vast deposits of gold, platinum, radium, or the like to be found on some of them, the financial world will become interested. Adventurers will flock to the distant planets and satellites. The demand for your product will be tremendous. Yes, indeed, I should say there are several fortunes in it."

SORENSON became alert once more.

"That has been my thought, Professor," said Teddy. "And I want to know if you really believe that any of the planets are inhabited by intelligent beings?"

"I don't see why not," responded the professor. "At least two of them should prove habitable by beings similar to ourselves. Those two are Mars and Venus. Mercury is, I think, out of the question as it has practically no atmosphere. Still it may sustain some form of life in certain portions. Saturn is entirely hopeless since it is generally considered to be in a largely gaseous state. Jupiter is in somewhat the same class, yet both of these planets have a number of satellites which might conceivably be inhabited by some form of life. Uranus and Neptune are likewise believed to be largely gaseous, at least on the surface. But, nothing is impossible and I maintain that there are countless worlds in our universe that are inhabited by creatures in various stages of evolution, some undoubtedly much farther advanced in their evolution than the peoples of our own earth."

Sorenson displayed great interest now. "Do you really believe all this, Professor?" he asked.

"I most assuredly do," was the measured response. "Many of our recent findings bear out these suppositions to a remarkable degree. And with the new reflector which will be completed within the next few days, we should be able to learn much more of our neighbors in the solar system. But, my young friend, how do you propose to guide this gravity vessel?" he asked, turning to Teddy.

"Very simply, Professor," said Teddy, "I propose to build it in spherical form with the shell composed of numerous sections of super-silicon steel, each section insulated from its neighbors. The energizing mechanism will be capable of acting on any group of these sections at will or on the entire number if desired. Thus, when we leave this old earth of ours, it will only be necessary to use the maximum neutralization on the entire surface, when, with gravity reversed, we shall shoot into space like a rocket. When outside the earth's atmosphere, we shall guide our course by shifting the energies to those particular sections, where they may become necessary. We can at will permit ourselves to be attracted to any body in the heavens. With the attraction on all sides save one counteracted, we shall literally fall to the body on which we desire to land or which we wish to observe more closely. The speed should be terrific since the acceleration, when falling toward an attracting body in the vacuum of space, will be tremendous. I am confident we can approach the speed of light if we so desire."

"Yes, I believe that is possible," said the professor, "and I can pick no flaws in your arguments. But how long a time will be required to build such a vessel and how can you hide it from the curious world while it is under construction?"

"If Mr. Sorenson agrees," answered the engineer, "I intend to commence work at once and if all goes well, the vessel should be completed in less than two months. Most of the internal mechanism can be produced by making simple modifications in standard electrical machinery, obtainable from the large manufacturers on very short

delivery. The framework of our sphere will be built up from standard steel beams and angles obtainable with equal ease. The super-silicon steel plates of the hull will be forged in our own shops in record time. I am not so sure about the assembly, as this vessel must be of considerable size. It must be not less than 140 feet in outside diameter, according to my calculations. That is an extremely difficult object to hide. And, of course, there will be an army of workmen engaged in its construction and these can hardly be expected to keep silent. But we might issue statements to the press, which would mislead the public and provide a camouflage for our real intentions."

"After all," asked the professor, "is it really necessary to hide your plans?"

"It surely is, Professor," laughed Teddy. "If you only knew how we are spied upon by the hirelings of our competitors in this air-craft game you would not ask such a question. Why, they watch our every move and are continually on the alert to beat us at our own game. All's fair in love, war, and business you know."

"Then it is indeed a problem," said the professor gravely.

"But we shall solve it," interjected Sorenson. "We have cracked harder nuts than this. I'll move heaven and earth to put this across, now that I am convinced it is the thing to do. But, one thing still puzzles me. Who is to venture on the trial trip of this contrivance?"

"I will," said Teddy, eagerly looking for the approval of his superior, "and I am certain that I can count on most of my men in the research department to make up the crew."

"Well, I myself would not be so foolhardy," snapped Sorenson, "and I should hate to lose your services on such a gamble."

"It will be no gamble," objected the engineer. "This ship will be under absolute control at all times and we can return to the earth at any time we wish. We need not land on any planet should our inspection from a safe distance make this landing appear dangerous."

The professor interrupted timidly, "And gentlemen, you can count on me to make the trip also. That is, if my presence would be welcomed."

"Why, you old sport!" exclaimed Teddy delightedly. "Nothing could please me better. And your knowledge of the heavens we are to explore would be of incalculable value in navigating the vessel. Three cheers!"

Professor Timken beamed his pleasure at this and looked to Sorenson for confirmation.

"There are more fools in this world than I thought," said that gentleman testily. "But now that we are agreed I suppose we had better start the wheels at once. I leave the entire matter in your hands, Teddy, and your appropriation will be ready in the morning."

He waved aside the expressions of gratitude from the engineer and the astronomer, rising from his chair preparatory to leaving.

"And now I must go," he continued. "Do you wish to accompany me, Teddy? Or had you rather remain here for a chat with your old friend?"

"I had rather remain a while if you have no objection," said the younger man.

"Very well. Good-night to you both." The great executive was gone and the two friends shook hands in their glee, not at his leaving, but at the prospect of the great adventure before them.

When Sorenson was safely away in his aerocab, Teddy drew a flat package from an inner pocket and spread before the professor's eyes a sheaf of blueprints.

"These," he said, "are complete plans for the 140 foot ship. I did not tell Sorenson that they were in existence as these moneyed men are sometimes given to the upsetting of the best laid plans of their subordinates. But now that he has agreed I shall lay them before him at once. They never leave my pocket except in the privacy of my own rooms. But I know I can trust you and there are a few points on which I should like to have your advice."

The professor looked over the drawings with increasing interest and the two men sat far into the night discussing various details of the design and planning for the adventure so soon to come.

CHAPTER IV

The Electro-Telepathoscope

RALPH PRESCOTT had concluded his second day in the establishment of Doctor DePolac and had not as yet experienced a recurrence of the hallucinations to which he had been subject. Now, on the third night, there was gathered a group of medical men in the room adjoining his, and these men, four in number, were clustered about a rectangular screen some three feet square. This screen shone in the semi-darkness with an indistinct and shifting radiance that indicated to the watchers that the patient had fallen asleep. A few minutes earlier his every waking thought had been registered on this same screen and in the minds of the experimenters through the medium of the inductive connection to their own brains from the helmets they wore.

Here sat four of the most famous members of the medical world with their heads encased in extremely awkward and unbecoming metallic coverings, each with a heavy cable connection to the machine on which the viewing screen was mounted. But these great men were completely absorbed in the experiment.

THIS invention of DePolac's—the electro-telepathoscope—had been explained in detail to his colleagues, and those who had arrived early enough to witness some of its workings during the patient's waking moments were absolutely astounded at the results. Instruments which permitted of partial thought-transference had been in use for several years, but never before had a machine been devised that provided for complete contact with both conscious and sub-conscious mind. Never had it been possible for thoughts to be conveyed from the mind of a subject to a number of observers as was now being done. And never before had the mental images from a subject's brain been projected on a screen as if they were motion pictures or television reproductions. This combination of visual picturings and mental impressions provided the most complete and accurate exhibition of thought-transference yet accomplished and the visiting physicians were loud in their praise of the inventor of the instrument. True, some of the images were short-lived and indistinct, even as they are in the mind of the thinker. But, true pictures from his brain they were, and not to be misunderstood.

Doctor DePolac did not explain all details of his apparatus, for obvious reasons, but its possibilities were self-evident. He pointed out that, by means of the picking up of both the actual ideas and the resulting mental images, it was now possible to diagnose many cases which had hitherto been hopeless on account of the necessity of using interpreters in conversing with patients who spoke only languages foreign to the knowledge of the attending physician. In the case of the electro-telepathoscope, ideas only were recorded and no translation was necessary. A man thinks in his own language but the language of thought is universal. Any sequence of ideas from the brain of the thinker would naturally be impressed on the brain of the observer as a sequence of similar ideas and would be interpreted in his own language, regardless of the tongue in which the subject might have uttered them had they been spoken thoughts. Pictures, likewise,

are a universal language and any picture conjured up in the mind of a subject would be projected on the screen exactly as pictured originally.

Thoughts, he explained, by means of the delicate mechanism of the electro-telepathoscope, are translated into complex vibrations of a frequency far higher than any encountered in the transmission of voice or power by radio-vibrations later separated into their various components and reimpressed on the brain of the observer as actual thoughts induced in his own mind or thrown on the screen as actual visual images. Thus, with the apparatus connected with the brain of a sleeper, all visions seen as in a dream become visible on the screen of the instrument, all conversation attendant upon the characters appearing in the sleeper's dream impress themselves as duplicated thoughts in the brain of the observer.

The learned men were startled by the sudden change in color of the screen before them. It had shifted to a pale green tint; swirling mists of eerie brightness clouded its surface. Instantly each of the doctors had the sensation of being gripped by an unknown force. Horribly distorted faces peered at them from the green mists, voices babbled in their ears. Yet not a sound was actually heard—it was entirely mental impression. The mists parted and in their midst, in the unfathomable distance, stood the figure which Ralph had previously described to Doctor DePolac.

"Gentlemen," the voice of the doctor broke the intense silence, "I have not told you much regarding the case of the patient in the next room. But we are now witnessing the dream or hallucination, or whatever it might be, that has driven him almost to the verge of insanity. This is extremely interesting."

ONLY the heavy breathing of the audience answered him. They were all suffering with the patient. His own fears came to them and silence reigned in the room. Soft flabby hands reaching from the horrible green clouds seemed to grasp each and every one of them. In exactly the manner described by the patient each was seemingly paralyzed by strange forces, picked up bodily and hurled with terrific, body-rending speed into the depths of an awful unknown realm. The majestic figure in the distance loomed larger and larger, ever beckoning. The mists leaped and twisted with the motions of its hands. Closer and closer they approached and the figure became that of a woman, a woman of strange beauty and heroic proportions. She seemed about to speak but something restrained her. There was a slowing of the rapid motions of the green mists and their attendant multitude of elfin figures. The light seemed to fade, seemed about to disappear entirely. The central figure became dim, the beautiful face took on an expression of keen disappointment. Then, with a shock to each of the watchers which later they likened to an explosion, the vision stabilized, the mists and the horrible creatures they carried vanished. Only the beckoning figure remained and she was now as clearly pictured as if she stood in their midst. She smiled triumphantly and commenced speaking. The words she uttered were in a foreign tongue but were perfectly understood by the watchers, who sat rigid in their chairs, incapable of movement.

"Hail, being from a far distant world," came the thoughts of that impressive figure. "At last have I succeeded. For considerable time have I attempted unsuccessfully to convey my thoughts to you through the vast distance which separates you from us. Now our minds are *en rapport*, though I know not who you are. Where you are I know well, for have not our scientists perfected optical instruments which have permitted me to see for myself that intelligent beings exist on your planet, so far from mine? Have they not directed waves to you over which my thoughts have been carried time and again?

"Forgive me if my attempts to communicate with your world have caused you mental and bodily suffering. It was necessary that this be so at first, but no longer will it be required. Having once penetrated the intervening void and obtained complete contact I shall be able to communicate with you at almost any time without the initial discomfort. You are now sleeping, for I receive that impression from you, but when you are awake it will be possible for you to return answers to my transmitted thoughts.

"However, I shall not trouble you for ten of your earth days. I shall give you my message now and allow you sufficient time to communicate it to your people and to find an answer to my pleadings. That there be no doubt in the minds of your people of the authenticity of my message, I shall arrange a demonstration on my world which your scientific men should be able to view through their optical instruments. We have endeavored to signal your world for ages but it has been evident to us that our signals were unseen. Even now we have no assurance that your optical instruments are sufficiently powerful to locate the prepared new signal. But we have hopes that they are and our signal will be of such magnitude that even with the poorest kind of instruments it should be observed. This signal is solely for the purpose of convincing your world that the thoughts you are now receiving do actually come from my planet.

"I am Thalia, queen of the planet Venus, in your own solar system. This may seem absurd to you and to your people. They may disbelieve your word when it is given forth. But they can not disbelieve my signal. I shall now set the date and the time for this sign. During the fifth darkness from this, at one-half revolution of your earth after the sun crosses the meridian at which my thought waves are directed, we shall project into the heavens a beam of ultra-violet light. This beam will be of conical shape and will reach to a distance of about ten thousand miles from the surface of our world and across your field of vision. The base of the cone will be farthest from the planet's surface and will be of a diameter exceeding three thousand miles. We have strong hopes that your people will be equipped sufficiently well to detect a signal of such great magnitude for ultra-violet light is invisible. Our hopes are based on the evidence of considerable scientific attainment on your world as observed by our astronomers. Likewise are our hopes of obtaining assistance from your people based on this knowledge.

"UNLESS we obtain assistance from another world we are a doomed civilization. And we are hoping against hope that such aid is obtainable. For ourselves, though we have investigated thoroughly, we do not know how to traverse space. We have, however, searched the solar system exhaustively for another civilization of great advancement which might possibly have learned this great secret. And, to the best knowledge of our scientists, your world is the most likely. Every evidence of our optical instruments points to the existence of peoples of great scientific attainment on your world, though we find it difficult to reconcile this evidence with the fact that you have never answered our signals. Our scientists argue, however, that it is quite possible you are much farther advanced in some branches of learning than in others, quite probably in the very branches where our people are deficient. We hope to find this the case.

"So I send my thoughts to you in pleading for aid to my harassed people. And this plea is in the nature of a warning as well. There are inhabitants of another world who have learned the secret of traversing space and it is these who have warred upon us incessantly for ages of

time. They are horrible monsters in form but of the highest intelligence and they normally inhabit. . . . (Here was a thought, a group of words not translatable into an understandable equivalent in thought in the mind of any of those receiving it.) It is quite conceivable that they may turn to your world after having entirely devastated ours, which now appears to be their ultimate intention. So, if it is not possible for your people to aid ours, you may at least take warning of this menace of the skies.

"On account of the mental strain, I shall not make this message of too great length and again I impress upon you the fact that we will give you the confirmatory sign at the time I have set. But I must tell you something of the condition we are in.

"Our civilization dates back some sixty thousand years and we had evolved into an extremely happy, prosperous, and scientifically advanced people many centuries ago. At that time we numbered more than ten billions of souls—now we are less than a half billion. Our enemies first reached us about two hundred years ago and they have continued to ravage our world from that time to this. They arrived in a great ship capable of traveling from their abode to ours in a short space of time and immediately set about to capture hundreds of our people and carry them off. We shudder at their supposed fate—nay I should say, certain fate, for these monsters are known to consume our people as delicacies of food. They do this before our very eyes on their semi-annual returns to our planet and, on each occasion, they take more than a thousand of our number with them. These beasts, for beasts they are, can scarcely move about on our world, for their own is presumed to be much smaller and our gravity is too much for them, but they have terrible weapons—energies with which they paralyze our people, whole cities at a time, thus allowing them plenty of leisure to move about in their sluggish way and accomplish their ghastly purpose.

"Not only have our numbers been reduced by the depredations of these monsters, but we have suffered in numbers through the alarming decline in the birth rate. Mothers hesitate to bear children who may later become food for the enemy. Sorrow and fear over-ride our once fair country.

"In addition to the destruction of life there is the theft of our natural resources. A radio-active substance from which we obtain all of our power was once quite plentiful here, but these monsters discovered our mines and stores of the substance and on each raiding trip they make away with huge quantities of the mineral. In fact their thefts have been of such magnitude that we are now becoming very short of this valuable material.

"Our scientists have determined that the atmosphere of your planet is almost identical with our own, that our surface gravity is only about fifteen percent less than yours, that our seasons are similar. It should thus be quite easy for any of your people to adapt themselves to life with us if you find it possible to reach us. But we hesitate to invite you here to certain death and insist that you do not consider heeding our pleas for help unless you have some engines of destruction of great power, unless you have some means of insulating yourselves from the paralyzing rays of our enemy. We have been unable to do this, but our scientists have determined from spectroscopic analysis that certain metals and minerals which are extremely rare on our planet are available to you in quantity. Possibly you can make use of some of these. In my next message I shall endeavor to apprise you of the nature of these weapons of the enemy. Certain determinations of our scientists, while they have proved of little value to us, might lead you to the discovery of methods of counteracting the terrible agencies.

"WERE we not so desperate this plea should never have been made. In our discouragement your world is our one hope—may the Power which controls all grant it be not in vain. Thalia bids you farewell until the fifth darkness."

The sad, sweet smile faded. The green brilliance merged into nothingness. The screen was blank. The message was completed.

Doctor DePolac was the first to recover. He rushed to the wall switch and a flood of normal electric light filled the room. His colleagues stared at him and at each other in amazement. They were greatly shaken and each face was as white as if its owner had seen a ghost. Doctor Rebedeau laughed a bit hysterically. He was a highly emotional little Frenchman who had done much in the line of neurological surgery. The others maintained solemn expressions.

The Frenchman broke the silence, "Shall you awaken ze patient now, Doctor?" he inquired of DePolac.

"A good idea," answered the great man, who had not himself recovered his usual poise. He stepped from the room.

Rebedeau laughed once more. "Zat is ze most wonderful exhibition of what you say?—hokum?—zat I ever saw."

The other two medical men frowned him into silence before Doctor DePolac re-entered the room with his sleepy-eyed patient, who was bundled into a voluminous bathrobe and who shuffled into the bright light rather dazedly. He clung to his guide like a child and was gently lowered into a large arm-chair. With his head bowed into his hands he seemed to be trying to bring himself back to earth and, with the four physicians watching in interest, he suddenly sprang to his feet and looked about him with astonishment. He gazed at the screen, observed the helmets which had not yet been removed from the heads of two of the doctors.

"Did—did you gentlemen see and hear what I did?" he stammered.

"I believe we did," replied Doctor DePolac, "and I also feel that you are cured, my boy."

"So do I," said Ralph excitedly. "Once this queen Thalia, or whoever she is, reached me with her thought waves, the spell was broken. But what I suffered before!"

"That's it exactly," agreed the doctor. "This has been a case of enforced mental telepathy under very trying conditions and you have been going through experiences similar to the old nightmare of being chased by a lion and not being able either to escape or cry out for help. It must have been a tremendous strain, but I do not believe you will be troubled further."

"But," interposed Doctor Rebedeau, "surely you do not take seriously zis nonsense about ze queen of Venus?"

"I certainly do," said Ralph stoutly. "Why not?"

The Frenchman shrugged his shoulders. "Oh, very well," he said, "but to my mind someone is, what you say?—putting one over. Me—I do not believe it."

At the frowns and silence of the others he stamped his feet and, without another word, rushed angrily from the room.

"Well, that's that," laughed Doctor DePolac, "and I can't say I blame him much. It seems improbable, but I must admit that I was quite convinced by the beautiful lady while this remarkable demonstration was taking place. Undoubtedly this was thought transference. Whether it actually was done from the planet Venus I am quite unprepared to say, but these thoughts were impressed on our young friend's mind from somewhere and retransferred to ours. I shall be convinced of the source if this sign is forthcoming on the fifth night from this."

"But, Doctor," asked Ralph, "will you make this public?"

The famous psychiatrist corrugated his brow in thought. "No, I believe it is better not to," he replied. "At least not until after we assure ourselves of the genuineness of the vision by means of the promised signal."

"But how shall we know of this signal without communicating with some astronomer?" asked Ralph.

"We can't," said the doctor. "But fortunately I have a very dear friend, a Professor Timken, who is at the observatory of Strathmore College. We can go to him with safety and the newspapers will be no wiser. Then, if the thing proves to be a hoax, we shall not be subjected to ridicule."

HE addressed the two remaining physicians. "I am sure I can rely upon you two gentlemen to keep the secret, can I not?" he asked. "Of course Rebedeau will be a little difficult, but I believe I can silence him."

The two other witnesses assured DePolac and Ralph that no mention of the matter would be made by them, and after a little further discussion they took their leave. Apparently they had not much faith in the experiment, except as a remarkable demonstration of a remarkable instrument, which had permitted them to witness the peculiarly vivid dream of a partially deranged mind.

When they were alone, Doctor DePolac gazed at Ralph long and earnestly.

"Ralph," he said, "if I may call you by your given name, somehow I am inclined to believe that you actually have received a telepathic message from Venus."

"So am I, Doctor," said Ralph, "for how could I possibly have dreamed the thing in such detail otherwise? I know absolutely nothing of astronomy, nor of atmospheres or gravity. The language of the science is entirely unknown to me, yet all those terms were conveyed to my brain with the utmost clarity."

"Quite so—quite so," said the doctor thoughtfully, "while I, on the other hand, have some knowledge of astronomy—just a bit, through my association with Professor Timken. He has always felt that some of the other planets are inhabited and this will be great news to him. My boy, I need a rest myself, and you and I are going to take a trip to Philadelphia and run out to the observatory for a talk with the professor. We shall remain there until after the time set for the signal, and somehow I feel that we shall be privileged to observe it through the telescope."

"But, Doctor," said Ralph, "suppose all this is the truth. Suppose this message did actually come from Venus. It is utterly impossible for anyone from this earth to reach Venus, or to help the people of that planet in their extremity, even if they could make the trip."

"Yes, that is quite another matter, Ralph. But, who can tell? Our television radios were impossible too—twenty years ago. Some day someone might find means of traveling in space and then, who knows, perhaps we might be able to help—if it is not too late."

"But, Doctor, if this signal is to be a beam of ultra-violet light, how could it be seen, even through a telescope of great enough power? It seems to me I have read that this ultra-violet light is invisible."

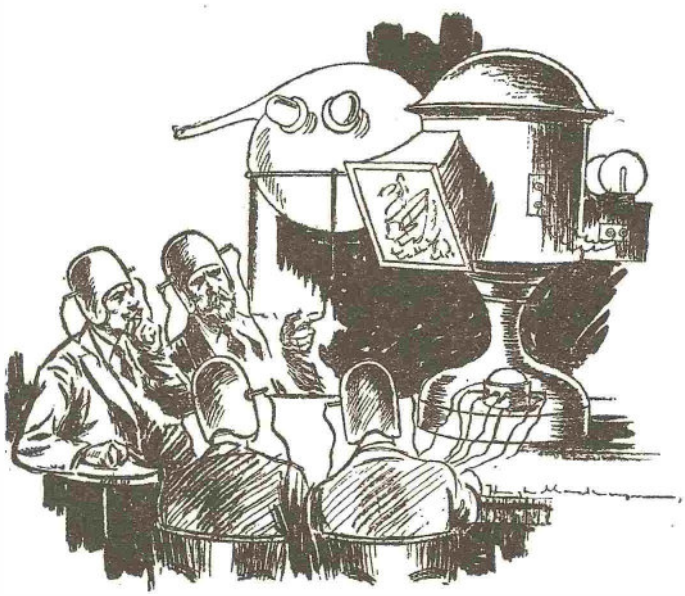
"It is—to the human eye," the doctor replied. "But I do know that it can be detected by means of what is known as a photo-electric cell, the element that is so vital to our television systems. Just how it would be accomplished in this case I do not know, but I am sure my friend Professor Timken will be able to find a way. At any rate, suppose you and I take the nine o'clock air liner to Philly to-morrow night?"

"Nine o'clock it is," said Ralph, "and now since it is not yet midnight, I think I shall return to my hotel for a good night's rest. I'm sick of this hospital bed of yours."

"Don't blame you," smiled the doctor. "I'll wait until you dress and we'll leave together."

It did not require much time for Ralph to don his street clothes and pack his small bag. Within fifteen minutes, he and the doctor parted at the door of the Professional Building, each going his own way with the spirit of adventure stirring in his bosom.

Four of the most famous members of the medical world sat, with heads encased in extremely awkward and unbecoming metallic coverings, each with a heavy cable connection to the intricate instrument, not unlike a radio television set, on which the viewing screen was mounted.



CHAPTER V

Strathmore Observatory

WITH a grunt of dissatisfaction Professor Timken reloaded the slide at the lower end of the twenty-four inch refractor in the old main observatory of Strathmore College. It was an hour and a half before midnight and he had just finished a three-hour exposure of a star cloud in Andromeda. With the new plate-holder in place he swung the axis of the telescope around to the right ascension and declination of the star marking the next field he was to photograph. It was very cold

The majestic figure in the distance loomed larger and larger. The mists leaped and twisted with the motions of its hands. Closer and closer they approached and the figure became that of a woman of strange beauty and heroic proportions.

in the dome room, for all windows were open to keep the temperature of the delicate instruments as near as possible to that of the outer air. And this new setting of the telescope was at such an angle that the professor was due for a long period of sitting in a cramped position in the observer's chair high up on the movable ladder-like structure which stood alongside the wall. And, for this new exposure, it was necessary to watch the cross-hairs in the supplementary eyepiece for two hours. On account of minor errors in the movements of the clock which kept the telescope trained on the field to be followed and in the bearings of the polar axis itself, it was necessary to correct these errors occasionally by means of two thumb-screws which could be carefully manipulated so as to keep the cross-hairs definitely upon some chosen star in the field, thus preventing a blurred photograph due to the drifting of the field across the plate being exposed.

His dissatisfaction he could not have explained to himself had he been asked to do so, for he was engaged in precisely the sort of work that he loved. But to-day he had been notified that the new reflector would be ready for service within the week and his old unreasonable jealousy for his smaller refractor had reasserted itself. Besides this, he had engaged in day dreams for more than forty-eight hours—ever since his friend Teddy Crowley had visited him and imparted the news of the new space flier. He thought more and more of the possibility of making a trip through the universe he had searched and studied for so many years, the universe he had charted and measured to the best of his ability and of the instruments with which he worked. He speculated continually on the likelihood of actually making such a trip and on the wonders to be encountered were it really accomplished. He had not yet drawn the slide which covered the plate to be exposed when there came a ring at the door and he hastened to answer it.

Peering through the glass he was astonished and delighted to make out the features of another old friend of his, Doctor DePolac, who had with him a fine looking younger man clad in a heavy ulster. It was now nearly the middle of November and the nights were cold.

The professor unlatched the door and welcomed his friend enthusiastically. After being presented to the younger man, he led the two visitors into his comfortably heated office and promptly forgot the work he had left unfinished in the dome room.

"Well, bless my soul," he said, "what on earth possessed you to visit me at this hour, Doc?"

"Important business this time, Prof.," was the reply. "We are sadly in need of your advice. My young friend Ralph, as well as your humble servant, will want to locate rooms nearby, as we intend to remain here for five or six days. And we are going to ask you to do a great favor for us on the eighteenth at midnight, at which time we wish you to arrange to observe a phenomenon which we expect to take place on the planet Venus. Can you oblige us, Prof.?"

"I certainly can," said the professor. "But what on earth can you mean by saying you expect some phenomenon to occur on that planet at a definite hour?"

The doctor laughed. "Maybe we're crazy," he said, "and it is a long story, but both my young friend here and I have a feeling that something is to be observed. Listen carefully and I'll tell you why."

THE professor listened spell-bound through the long recital of the supposed message from Thalia, queen of the Venerians. His eyes took on that faraway look at times; at others they snapped with eager fire. Here at least was no scoffer.

"What do you think?" asked Doctor DePolac when he had finished his story.

"I am absolutely astounded," replied the professor, "and I am not disposed to doubt the possibility at all. Of course I have no personal knowledge of telepathy, but from what I have read on the subject and from your own experiences, I have no doubt of its existence. As to the transference of thought over so great a distance as separates us from Venus, this seems quite a remarkable feat, yet if thoughts could be impressed upon a beam of high frequency vibration similar to radio waves, I see no reason why they could not be transmitted to our earth. The selection of a subject for the reception of such thoughts is, I think, the most mysterious part of the whole thing, but if any of it is possible, there is very likely some way of explaining this phase too. But we may find some difficulty in actually visualizing the ultra-violet rays which are to be used as a signal."

"But," asked the doctor, "could that not be remedied by means of some arrangement of photo-electric cells?"

"Yes. But it would involve a multiplicity of cells, preferably of the selenium variety, and the image would be badly distorted. Besides, we have not sufficient time to construct such an arrangement. However, I shall start work in the morning and I am sure I can find some means of making this signal visible to the eye through our telescope. Failing in this, we can always rely on a single selenium cell to indicate the presence of a large amount of ultra-violet light and this should be sufficient proof for our purpose. I am inclined to believe we are really going to see this sign."

"Then you actually feel there is the probability of human beings inhabiting the planet?" Ralph broke in excitedly.

"Yes, I do," answered the professor; "the question of worlds other than our own being inhabited is one that has always fascinated me greatly. I have always believed it possible, and determinations of recent years have tended to make me even more certain. Take the planet under consideration, for instance. It has an average diameter of about 7,700 miles, only about two hundred miles smaller than the diameter of our own earth. Its mass is eight-tenths that of our earth and the gravity at its surface about eighty-five or ninety percent of ours. Beings quite similar to ourselves could thus exist on the planet, provided its atmosphere and seasons are similar to our own. For many years this was in doubt but it is quite conclusively proved now that similar conditions do exist. As far back as 1740 it was inferred from observations that the planet rotates on its axis in 23 hours and 20 minutes. In 1790 Schroter determined its period of rotation as 23 hours and 21 minutes and the inclination of the plane of its equator to that of its orbit as fifty-three degrees. These determinations were later refuted by Schiaparelli and others who maintained that its periods of rotation and revolution were equal and that the same face was always toward the sun.

"The character of its seasons of course depends upon which of these theories is the correct one. If the planet rotates in the space of about twenty-four hours and if its equator is inclined to the plane of its orbit, the seasons must be similar to ours. However, if the same face were always toward the sun, that side would be terrifically hot continuously and the other exceedingly cold. But the latter possibility has been definitely disproved, for within the past few years it has been conclusively shown by observations all over the world that Venus rotates on its axis once in 23 hours and 26 minutes, thus confirming almost exactly the conclusions of the earlier observers.

"As regards the atmosphere of Venus, we are sure of its similarity to our own. When Venus transits the sun, its disc is surrounded by a luminous atmospheric ring. Also, when not in transit, but when near inferior conjunction, the atmospheric ring is often seen to extend beyond the horns of the crescent. Spectroscopic observations point to the conclusion that this atmosphere contains water vapor, so taking all together we have ample proof that its atmosphere is not only similar in composition to our own but in extent as well."

"Go to the head of the class," laughed the doctor. "But, all joking aside, Professor, this is very interesting and, as far as I'm concerned, it makes me all the more certain of the authenticity of our mental message and all the more eager to see further proof."

"Same here," said Ralph, "but, if all this is true and if we are finally agreed that the planet is in the condition described, what are we to do about it? We can't get there, and we couldn't help the inhabitants if we did get there."

"I'm not so sure of that, my boy," said the professor, "and it is a strange coincidence that the visit of you two gentlemen follows so closely the visit of two others who have actually discovered a means of traveling through space."

"What?" asked Ralph and the doctor simultaneously.

"Nothing else. Night before last the president of the Sorenson Aircraft Corporation and his Consulting Engineer visited me here and told me of an invention of the engineer's that will make it possible to construct a space ship which should be able to reach any of the planets. As a matter of fact, they are now engaged in building such a vessel. At this moment the work is being rushed to the limit and I understand that castings are already being poured and that detailed portions of the machinery are on order from other manufacturers."

RALPH and the doctor were astounded beyond measure. The three men looked at each other with eyes glistening in anticipation.

"But," objected the doctor, "it is a long distance to Venus. How long a time would be required to reach it in this vessel you describe?"

"Not so long a time as you might think," said the professor, though the planet is nearly 26,000,000 miles from us at its nearest approach and over 160,000,000 miles at its greatest distance. Be that as it may, this ship, which is being constructed by the Sorenson people, should be capable of covering the distance in a very short time. Its speed through outer space will be terrific; in fact, it might conceivably approach the velocity of light —186,000 miles a second."

Ralph and the doctor whistled.

"Pretty fast, isn't it?" smiled the professor. "You can figure it out for yourselves. Say the speed is only 150,000 miles a second on account of unavoidable losses—that is 540,000,000 miles an hour or more than three times the distance to the planet at its farthest point from our earth. In other words, it should be possible to reach there in less than twenty minutes after leaving the earth's atmosphere. Of course, in actual practice the speed will have to be kept at a much lower point on account of the danger of colliding with planetoids and other bodies—in all probability it should not be attempted at more than about one-fiftieth of the maximum, say 3,000 miles per second. At this rate about fifteen hours would be required when the planet is in superior conjunction, that is, when it is farthest from our earth."

Ralph was astounded at the figures and did not hesitate to say so.

"The distances mentioned are as nothing in the vast depths of our universe," replied the professor to his remarks. "Neptune, at the outermost limit of our solar system, is 2,800,000,000 miles from the sun. But the moment we leave the solar system the mile can no longer be used as a unit of measurement. We therefore substitute the light-year, nearly six million million miles. Light traveling at the rate of 186,000 miles a second would pass around the earth in less than one-eighth of a second, yet it would require four and a third years to reach the nearest star outside our solar system, Alpha Centauri. In space beyond what is known as the galactic system, the huge aggregation of stars of which our solar system is an infinitesimal part, there are star clusters and nebulæ visible to our telescopes and measuring as far distant as a half million light-years."

Ralph had no more to say at this and the professor and Doctor DePolac smiled at his open-mouthed amazement. It was his first introduction to the wonders of the universe.

"Well," continued the professor, "there is no sense in our sitting here all night in idle discussion. Plenty of work must be done in the next few days and we should all be in our beds. Why not come home with me and remain as my guests while you are here? I am a bachelor temporarily; Mrs. Timkin is in Florida for a few weeks; and if you have no objection, I am sure I can accommodate you nicely."

After some little good-humored argument about the matter, the visitors accepted the invitation and, when the professor had closed the observatory, they left with him for his home.

THE succeeding four days were busy ones, indeed. Ralph and the doctor were of very little help, since the professor was engaged in constructing an extremely complicated apparatus in the workshop of the observatory.

But they spent much of their time in poring over the many books in the library, learning all they possibly could regarding the solar system and its planets. They made several visits to the plant of the Sorenson Aircraft Corporation and, upon introduction to Teddy Crowley by the professor, were permitted to witness the work that was being done on the new space flier. Crowley took them into his confidence regarding his plans, but was not rewarded by their own confidence in the matter of the message from Venus. This was at the express request of the professor, who wished to spring it as a complete surprise on the night of the expected signal. But they found young Crowley very much to their liking and rapidly became close friends with him. They likewise visited the new observatory and watched the final adjusting of the new reflecting telescope, marveling at its tremendous size and at the accuracy with which the setting of the polar axis was being made. They did not share the professor's jealousy of the great instrument and could not quite comprehend his attitude, but they saw through it and were secretly amused at the grudging way in which he admitted that the reflector would be far better adapted to the search for the signal than the small refractor with which he had worked for so many years.

"You, see," the professor had explained, "in a refractor, the light from the distant star or planet is filtered through an objective which is of glass and absorbs much of the blue and violet light. The ultra-violet is almost entirely filtered out so it would be practically impossible to observe a signal of the sort described by your supposed informant. With the reflector there is no such absorption, since the light is reflected from a silvered surface and does not pass through any absorbing medium at all until it reaches the eye-piece. The instrument I am constructing likewise contains no lenses which might absorb the ultra-violet light. Rather, it is a series of especially constructed mirrors to be placed at the focus of the reflecting mirror, which mirrors are so arranged as to project the image through a sheet of ionized air which causes the ultra-violet rays to become visible to the human eye. The image is then viewed through an eye-piece which necessarily absorbs some of the rays but not a great enough proportion to reduce their visibility. The new reflector will be ready in time and so will my new instrument. We have no fear of missing the signal if sent, provided only we have a night of good visibility. That is the one thing your queen did not take care of."

As night came on the date set, Ralph and the doctor were extremely nervous. So was the professor. It had been cloudy early in the day, but the depression of the three men on this account was lightened by the clearing up in the afternoon and the welcome appearance of the sun. However, it had blown up quite cold a little later and there had been a noticeable change in the barometer. The professor explained that this might affect the visibility appreciably but he hoped for the best.

The great new reflector was ready and was being tested out by the workmen. Ralph and the doctor marveled at the ease with which its great bulk could be shifted about the two axes to cover any desired point in the heavens, and at the mechanism of the huge clock which turned it about the polar axis to counteract exactly the motion of the earth and thus maintain the star images exactly in position in the field of view.

Teddy Crowley had been invited by the professor to witness the completion of the new telescope and he arrived at just about nightfall. The three visitors watched in interest as the professor attached his mysterious supplementary instrument to the framework of the huge cage which formed the tube of the monster optical masterpiece. This task was completed fully an hour before the time for which the signal was promised. Teddy was the only member of the party who did not know what to expect and he was the only one who did not display nervousness as the time approached.

With his instrument securely attached in place, the professor approached the immense pier on which the telescope was mounted. He grasped the controls of the motors which swung the huge instrument and, with a hum from within the pier, the great framework swung majestically about the polar axis. With a few simple manipulations, he had directed the instrument to the right ascension and declination of the star cluster Messier 79, 85,000 light years away.

He peeped into the eye-piece and exclaimed delightedly, "Atmospheric conditions are perfect. Gentlemen, just look at this."

He moved aside and allowed each to gaze at the globular mass of brilliant stars which appeared in the field of vision. By the expression on his face they could see that he grudgingly admitted the wonderful power of this new instrument.

THE visitors were shown many of the wonders of the universe and, without exception, marveled greatly at what they saw. It was Ralph's first experience at the eye-piece of a large telescope and he was undoubtedly more impressed than any of the others. But Doctor DePolac and Teddy Crowley both exclaimed at the enormous power of the new instrument and at each word of commendation the professor seemed to wince as if his old stand-by, the twenty-four-inch reflector, was being insulted. But he quickly cast off this mood as the time for the appearance of the signal neared. He started a motor which formed a part of the supplementary mechanism he had attached to the telescope and, this done, swung the instrument around to a new position. He peered through the eye-piece and advised the visitors that the instrument was now trained on the planet Venus. This meant little to Teddy, but to Ralph and the doctor it provided a distinct thrill.

The professor straightened up from his position on the observer's platform and glanced at the sidereal clock.

"Only two minutes yet," he exclaimed, "and I might warn you, Teddy, that we are about to observe something we have been waiting for. At least I hope we are. And, if the thing we are expecting appears, it will be a great surprise to you and an incentive as well."

He did not explain further and, since he at once returned to the eye-piece, Teddy did not question him. Ralph and the doctor watched the clock anxiously. Those two minutes seemed interminable.

Suddenly there came a sharp exclamation from the professor. "It's there. It's there!" he shouted. "Look for yourselves."

He jumped from the platform and capered like a boy. The doctor hastily took his place and a feeling of great awe surged through him as he observed the confirmation of Thalia's message. There in the field of vision was the disc of the planet, bright and distinct. It was yellow in color and seemed the size of an orange. The surface markings were dimly visible through its extensive atmosphere. To the right spread a fan-like flame of pale blue tint which extended into the heavens to a distance fully half again the diameter of the planet. The bluish cone of light wavered and danced like the lights of the aurora borealis. The doctor gasped and grew pale as he watched.

Ralph could wait no longer and unceremoniously elbowed the doctor aside so as to obtain a view of the marvel. When he saw it, he was as excited as the professor. Here was positive proof of the truth of the message from the far-away world. Venus was inhabited, and Queen Thalia had spoken to him truly! He left the platform and sat down weakly on one of the steps nearby, allowing Teddy Crowley to obtain the next view.

IT was an excited group that left the new observatory building a few minutes later and repaired to the professor's office in the old building. Teddy Crowley had witnessed a strange phenomenon, but he still did not know what it was all about.

When they were all seated in the office, the professor turned to Teddy.

"My boy," he said solemnly, "what you have just witnessed is a signal to our world from the people of Venus."

"You are joshing me, Professor," he said. "How do you know?"

"I am not joshing one little bit," said the professor, "and, if you listen carefully, I shall tell you how we know what it is."

He told young Crowley the story of the experience in Doctor DePolac's establishment back in New York exactly as it had been told to him. He called upon the doctor and Ralph to substantiate certain points and to elaborate on the story. When he had finished, there was a deep silence in the room for the space of several minutes.

"So that's why you fellows were so infernally interested in my space ship?" he finally sputtered. "Well, I can't say I blame you at all. But, great guns! how on earth are we to help these beings? We can go there in my vessel, I feel certain, but how in the name of time can we aid them?"

"Yes, that is the great problem, I fear," said the professor. "But the first thing to do is to finish this vessel of yours and make a trip to the planet to investigate. Do you think Sorenson will permit it?"

"Permit it?" snorted Teddy. "He'd better! Why, this thing will give him more publicity than he could buy with ten times the cost of the trip. But, unfortunately, it will be necessary to keep our plans secret on account of our spying competitors. But his publicity will follow, nevertheless. What a venture!"

He concluded enthusiastically and gazed at the expectant faces about him.

"I suppose you fellows will all wish to go?" he asked.

There was a chorus of assent.

"How soon can you complete your vessel?" asked Ralph eagerly.

"We'll rush it more than ever, now," replied Teddy. "Oh, boy! Wait till I tell old Sorenson to-morrow. He'll have apoplexy. And I'll have to have the support of all of you to make him believe it. If he agrees—and we must convince him—I'll put on a double force, three shifts a day, and we should be able to finish the machine in six weeks."

For several hours the men talked and planned. To each it was a great adventure and to each it had suddenly become the most important thing in his individual life—to reach this suffering people and to save them from further disaster if such a thing was within their power. When Teddy Crowley separated from the other three who were bound for the professor's home, he left one parting thought with them.

"Maybe—mind you, I say maybe,"—he said, "I know the very man to take along to figure out some way of helping the Venerians against their enemies. I'll tell you about him to-morrow."

This was flung through the window of his aerocab, after which, with a cheery "good-night" he was gone.

CHAPTER VI

Work Is Rushed

WHEN first advised of the mental message from Venus and the confirming signal, John Sorenson was inclined to be extremely sceptical. But he had given his word on the building of the space flier and, since work had already been started, he did not offer strenuous objection to the further rushing of the project and to putting the job on an overtime basis. He had always prided himself on going through with anything he started, and on doing things in a big way when he did them. And he made no exception in this case, though he continually insisted that he had entirely washed his hands of any participation in the expedition to Venus. But he offered no objection to the others making the voyage, nor did he balk at financing the manufacture of the vessel or the trip itself. When Doctor DePolac offered to bear a portion of the expense, he would not hear of it. To Teddy Crowley he gave full authority in the matter and he warned his engineer bluntly that he did not care to be bothered with any details nor to hear any more about the ship or the voyage, until they were ready to embark on their adventure. Then they might be sure of his best wishes and hearty blessings.

Ralph Prescott became so deeply interested in the project that he decided to turn the administration of his own business over to his assistant until such time as the great adventure had been completed, successfully or otherwise. He returned to New York with Doctor DePolac, but spent only a few days there putting his affairs in shape and instructing his assistant in conducting the course to be pursued during his absence. The doctor decided to remain at his work until the completion of the Comet and they were ready for the journey, at which time he would join them. He rather envied young Prescott the opportunity of being on hand during the construction and outfitting of the vessel, but felt that he should continue in the practice of his profession until it became actually necessary to leave.

Teddy welcomed Ralph on his return and was much pleased to enlist his assistance. With Ralph's business experience, he became a valuable addition to Teddy's staff. He proved to have an uncanny faculty of dealing properly with the many outside concerns, from whom it was necessary to purchase material and machinery, his insistence upon the fulfillment of contracts to the letter being in great part responsible for the speed with which material and parts were shipped and the resulting final completion of the Comet in record time. He and Teddy grew to be close friends and the admiration of each for the other increased steadily as work progressed. Their separate jobs dove-tailed and supplemented each other.

One of their first moves was to visit the Secretary of the Navy in Washington, and here they concluded arrangements to permit the assembling of their craft in one of the unused hangars of the Navy Department at Lakehurst, New Jersey. They were thus assured of freedom from spying eyes and the fact that news of the venture would not filter out to the general public and the press. Parts of the vessel which were fabricated in the Sorenson factories were brought to the hangar by fast aircraft, usually under cover of darkness. Electrical apparatus and equipment purchased from outside manufacturers was ordered shipped to various separate warehouses of the concern and reshipped from these over devious routes. Thus was absolute secrecy assured and the work went forward without fear of interruption or undesired publicity.

Ralph's education in engineering matters proceeded rapidly with the work on the vessel and he was astonished himself at the facility with which he picked up this kind of knowledge. Teddy seemed to take great delight in enlightening him regarding the functions of the many complicated mechanisms with which the ship was equipped, and the two men spent much time together in the shops and with the army of workmen engaged in the assembly of the vessel at Lakehurst. Teddy's aerocab was kept extremely busy carrying them back and forth from factory to hangar, and to various concerns, where it was necessary to inspect portions of the apparatus before they were shipped.

IN the observatory at Strathmore, Professor Timken worked incessantly with another member-to-be of the expedition. Captain Gregory French of the U. S. Ordnance Department had been brought to the observatory soon after the sighting of the signal from Venus. He was an old college chum of Teddy's, and it was he whom the engineer had in mind as a possible deviser of means for assisting the Venerians in their warfare against the unknown enemy. He became as enthusiastic over the project as the others, and immediately obtained a leave of absence so as to be able to work with them. After this he just naturally gravitated to the observatory where he and the professor exchanged ideas and worked continuously together in the laboratory in the attempt to provide weapons of offense and defense for the Comet's armament. This portion of the equipment of the vessel was secretly being provided by Doctor DePolac, who insisted that he be permitted to finance at least a part of the expedition. Sorenson had steadfastly refused to have anything further to do with the plans, so this insistence of the doctor's relieved Teddy of the necessity of approaching him for further appropriations to cover the armament.

The workmen engaged at the hangar were chosen with great care by Teddy and Ralph. They were kept in ignorance of the exact nature of the vessel they were assembling and, through an arrangement with the Navy Department, were sworn to secrecy regarding their activities. The entire atmosphere of the huge hangar was one of mystery and the workmen presumed they were engaged in the construction of some new aerial engine of warfare for the Government itself. Of course, it had been necessary to take certain government officials into their confidence to accomplish this, but this was readily done for the reason that the enterprise was being privately financed.

It was almost uncanny to observe the speed with which the vessel was assembled. Thousands of steel beams, ready-shaped when received, were welded into a continuous structure that rose quickly to form a spherical cage 120 feet in inside diameter, 140 feet outside diameter. Large cross-beams and lattice-like structures, likewise welded into place, formed the floor and wall supports of the numerous rooms of the ship. These were covered with the metal plates which were to provide floors, ceilings, and walls in the completed structure. As fast as it was received, the machinery was erected in the central engine room. Delicate instruments to indicate the performance of the apparatus and for navigating the vessel were installed in the control room. Elaborate tests were made of each individual portion of the equipment before its final acceptance and installation. From time to time the professor and Captain French delivered cases of munitions and weapons of nature unknown to the others. This portion of the equipment was left entirely to them and very little regarding its nature was divulged before the vessel was actually completed. True, the professor requested at the outset that the inner hull plates be made from a metal alloy for which he provided the specifications. This alloy, he explained, would insulate the vessel against the cosmic ray or any artificial vibrations of a nature which would endanger human life or destroy materials, which might be set up by their enemies in an effort to annihilate the ship and its occupants. Since this alloy, on test, showed equal tensile strength and elasticity with the best steel obtainable, Teddy readily accepted it for use and the Sorenson furnaces immediately started making up the metal in quantity.

Portholes in the frame of the ship were covered with an especially fused quartz composition which provided like insulation from harmful rays and yet permitted perfect transparency.

One by one the inner and outer hull plates were laid in place and welded to the framework. The outer plates were insulated from one another by means of narrow strips of Schrantz metal, a special alloy which, though an insulator to the gravity-neutralizing energy, was of great strength and could be perfectly welded to the ordinary steel framework as well as to the outer plates of super-silicon steel, which was alone activated by the energy. The entrance manholes were provided with air-tight seals and powerful inside clamps.

The sphere circumscribed a perfectly cubical inner structure, 69 feet on a side, which housed the power plant and four floors of separate rooms. In the space between the lower side of the inner structure and the hull of the vessel was the control room, with its many instruments and operating levers. On the four sides of the inner structure the spaces between the walls and the hull were occupied by storage compartments and passageways to the viewing ports. The upper space between the inner and outer structures was occupied by oxygen apparatus, refrigerating and heating apparatus and a workshop fully equipped with lathes, a forge, welding machines, and other machine shop equipment which might be required in making repairs.

The sixty-four individual staterooms were furnished simply and in much the style of those in the regular trans-oceanic air liners. The galley, dining saloon, and lounging room were likewise reminiscent of those of the larger ships, though much smaller in size.

WHEN four weeks had elapsed since the signal from Venus, Ralph and Teddy visited Professor Timken at the observatory. They were very much pleased with the progress of the work and had called to discuss plans for their departure. With the Comet nearing its completion at such a rapid rate it seemed certain that they should be able to start on their voyage by the first of the new year.

The professor and Captain French greeted their news with joy and hastened to tell them of the latest discoveries in the art of warfare. They reported the invention of a new and tremendously powerful explosive—an explosive so deadly that a single ounce of the compound effected more violent damage than a ton of T.N.T. At the moment, they were engaged in compounding several hundred pounds of this mixture for shipment on the Comet. They told of the completion of thirty hand weapons—cathode ray projectors, which could destroy life instantly and silently from the distance of a mile or more. Others of their discoveries and preparations were expounded in detail and it became apparent that the Comet was to be a veritable arsenal when it left the earth.

The four men sat in the professor's office and Captain French was describing with enthusiasm a semi-machine gun or automatic rifle which had been modified to fire bullets containing the new high explosive, when he glanced at Ralph Prescott and gave a startled exclamation.

"Look at Ralph," he said. "What's wrong with him?"

The others looked and saw that something strange was happening to their friend. He sat rigidly in his chair with the muscles of his jaws working spasmodically. His eyes nearly popped from their sockets but the vacant stare in which they were fixed told the others that he saw neither them nor any other object in the room. The professor hastened to his side and shook him, but there was no response. He waved his hand before the staring eyes, but they did not respond by so much as a flicker. It was a horrifying sight and caused considerable consternation for a few minutes, but the professor suddenly recollected the descriptions of the previous telepathic message and he laughed aloud in relief.

"Why, he's just getting another message from Thalia," he said. "I guess we have nothing to fear for his sake.

But he looks as if he were suffering and I suggest that we leave the room until it is over."

The others readily agreed and nearly tumbled over each other in their anxiety to get out. It was an awe-inspiring sight for some reason and they all felt as if they were escaping from some supernatural presence when they found themselves in the hall. They conversed in low tones for some little time until an exclamation from Ralph's lips apprised them of the ending of the trance-like state.

They rushed pell-mell into the office to find their friend standing before his chair, a little white and shaky but with a smile on his face.

"Well," said Ralph, "I've just had the second message from Venus and it was even more convincing than the first. I had been thinking it strange that there was no further effort on the part of Thalia to communicate with me because on the last occasion she said to me that she would send another mental message in about ten days. It is over a month now."

"A most remarkable thing!" said the professor. "What was the message this time?"

"IT was more than a mere message, Professor," replied Ralph. "This time it was a two-way conversation. Through some miracle of her thought-wave apparatus, the queen of the Venerians was able to obtain answering responses from my mind. She promised this on the last occasion, but I had hardly thought it possible. However, she seemed to get replies to her questions satisfactorily, though she made it clear that the results were still somewhat imperfect. But all of her thoughts came to me as perfectly as though they were spoken words and this time there was none of the mental agony or physical suffering I experienced previously. She knows now that we are preparing to visit her planet, though she seemed unable fully to comprehend the manner in which this was to be accomplished. But she is extremely happy over it and marvels greatly that we should have the ability to do such things on our earth. Further information regarding the activities of their enemies will be withheld until we arrive. Her delay in communicating again was occasioned by a terrible raid on one of the hitherto rarely bothered divisions of the planet. This time the enemy arrived in greater numbers than usual and accomplished more destruction than had lately been effected in a single visit. They also made away with more than nine thousand Venerians, including those they captured and carried back to their own mysterious abode on their return."

"It is the most remarkable occurence I ever heard of," exclaimed Teddy, "and if we find out later that all these things are true, I must take off my hat to the people of Venus for their accomplishment in thus communicating with our world. But, if they are so infernally clever and scientific, it seems queer to me that they are not able to devise some means of repelling their foe. Where did she say they come from?"

"That is the strange thing about it," said Ralph. "Her name for them and for their planet does not come through to me. Of course it is a thought she endeavors to impress on my brain, but there is no equivalent in our language for the thought as it is transmitted. When her thought is of Venus, my mind translates it as such, although they undoubtedly have a different name for their world in their own language. And it seems to be conveyed that they do not exactly know themselves where these beings come from, though they do know that they hail from some distant celestial body. The knowledge of their coming through interstellar space is implied, but they seem to be in the dark as to the exact location of the home body. There is something mysterious about it which my informant seems to be unable to convey to me."

"But I still can't see," said Teddy, "why so advanced a people cannot defend themselves against their attackers without our aid."

The professor interrupted, "That might be easily explained if we knew all. Suppose, as Thalia herself suggested, that the planet is lacking in certain metals with which we are extremely familiar, or that some of our commonest substances are extremely rare on their world and by the same token some of those that are very rare on earth are exceedingly common with them. In this case their progress in the arts and sciences would necessarily be along different lines from our own. They might progress much farther than we in certain branches and be far behind us in others. Quite evidently they are well versed in the setting up and transmitting of etheric vibrations of characters as yet unknown to us, but it is easy to conceive that they might know nothing whatever of the arts of warfare, due possibly to an inherent peaceable natural inclination, supplemented by the lack of materials, say, to make explosives. They may be far behind us in chemistry, we'll say—or the lack of certain metals might make it impossible for them to devise insulating mediums for their protection from the rays, evidently sent out by their enemies to accomplish their destruction. It is very interesting to speculate on such possibilities and I, for one, expect to learn much in our visit to them. I sincerely hope we are better equipped than they, along the lines necessary for protection and for offense as well."

A lively discussion followed and the net result of the evening was to increase the enthusiasm of the adventurers tremendously. Ralph came in for not a little banter about his being chosen as the recipient of the mental messages—his description of Thalia's beauty brought expressions of pretended envy from his new friends. But this was all taken in good humor and no serious thought was actually entertained of the possibility of any of their number becoming romantically inclined toward the Venerian women.

That night Ralph reached the doctor by radiophone and told him of the latest developments and of the second mental message. It reacted on the doctor very much as it had on those in the observatory and he then and there made up his mind to bring with him on the trip one of his electro-telepathoscopes for use in case other messages from Thalia were transmitted to Ralph *en route*.

THE succeeding several days marked even greater activity in the hangar where the final work on the Comet was being completed. Professor Timken and Captain French made daily trips from the observatory workshops with the professor's aerocab loaded to the limit with cases and canisters of materials and weapons, all of which were stored away in the compartments of the vessel. Dozens of air freight vessels discharged their cargoes at the entrance to the hangar and a continual stream of packing cases went aboard the Comet, each to be stowed away in its proper place in the cargo spaces of the ship. These were provisions for the journey; food, books, fuel—everything that might be required for the sustenance and personal requirements of the passengers. Furniture, rugs, bed linen, culinary articles, were received and taken to their proper places aboard. Excitement ran high as preparations went forward with efficiency and despatch.

On Christmas day the last shining hull plate was welded in place; to all external appearances the Comet was completed. But there still remained certain work in the interior. Lighting fixtures were being installed. Many of the rooms were not yet completely decorated and furnished, but it was evident that the ship would be ready for her maiden voyage no later than the second day of January. The personal belongings of the passengers were being brought aboard as fast as they could send

them and arrange their affairs at home. Ralph Prescott left for New York the following day to pack what few additional belongings he required and to advise Doctor DePolac to do the same. The short trip on the airliner seemed longer to him than it had ever seemed before.

Teddy Crowley remained on the job day and night. He could not rest until he had personally seen to it that everything was shipshape and that all needs of the voyage had been provided for.

Captain French and Professor Timken moved into their staterooms and spent all of their time aboard the vessel, assisting in every way they could.

John Sorenson could hold himself aloof no longer. His curiosity got the better of him and he promptly arrived on the scene. After his first visit of inspection, he could not be dragged away either by the pressure of business or by personal affairs. But he remained steadfast in his resolve not to accompany the adventurers on their journey. His faith in his engineer was supreme, and it was evident that he envied the bolder spirits who had volunteered to make the trip, but he stubbornly refused to believe in the messages from Venus, and could not be persuaded to cast his lot with the others. However, he was far from averse to the publicity for his corporation which would result from a successful voyage and to the financial gain which would be bound to follow. He was at Teddy's heels every moment and continually cautioned him against taking any undue risks which might precipitate failure of the venture and destruction of the Comet and its passengers. Then, when only two days remained before the date set for departure, he vanished from the scene and Teddy sighed with relief.

For Teddy Crowley was tired and happy to be left alone.

CHAPTER VII

Intrigue

WHEN Ralph Prescott returned to New York, he hastened to the office of Doctor DePolac. The doctor's secretary, Miss Sprague, met him in the outer office, and informed him that the doctor was in consultation and would not be available for a matter of a half hour. It was thus that he and Margaret Sprague became acquainted, for in the short wait for the doctor, Ralph found that he had much of interest to discuss with Miss Sprague. She remembered him from the night he had first visited the doctor, and commented on his improved appearance since that time. The arch smile she bestowed with the complimentary remark went a long way toward breaking the ice, for Ralph was not a voluble conversationalist when in the company of the opposite sex. But this cheery little personage attracted him at once, and he soon found himself chatting as freely as if they had been life-long friends.

It did not take much longer for Ralph to observe that Miss Sprague was an exceedingly attractive young woman, in addition to being a very efficient secretary. Her unusually graceful hands attracted him; the tapering white fingers, with their rapid movements as she busied herself with her records while she talked, provided so great a fascination, that he lost himself for a time in contemplation of their deftness. Then a pertinent remark in her conversation caused him to gaze intently into her eyes. And, in those steady brown orbs, he found so much more of fascination that he forgot the remarkable flying fingers. Her color heightened as her intuition told her of Ralph's attraction, and with the appearance of the flush she turned suddenly to the filing cabinet, leaving only the shining coils of her black hair exposed to the disconcerting stare of the young man. And Ralph's heart behaved most unaccountably, thumping with vigorous insistence and at an alarming rate.

But his tongue was now loosened once more and he explained to her the reason for his previous illness, soon drifting into an account of the subsequent events, the construction of the Comet and the plans for visiting Venus. Miss Sprague forgot her momentary embarrassment and listened eagerly to the words of the former patient. It was the most absorbing story she had ever heard and she found herself not only in sympathy with the plans to go to Thalia's assistance, but strangely envious of that far-away queen who could thus summon the aid of beings from a distant planet.

"Oh, I wish I could go," she said excitedly. "It would be such a glorious adventure."

Ralph looked his amazement. "But, my dear young lady," he said, "that would be out of the question. Don't you realize that the trip is one of extreme danger and uncertainty. Surely you would not be willing to take a jump into the unknown like this?"

"I surely would," she replied, without hesitation. "It is no more dangerous for a woman than for you men. And I'm not afraid. I'd go in a minute if I could."

"Yes, I believe you would at that, Miss Sprague," he conceded admiringly. "But there is no chance. All passengers on the Comet will be men and I'm sure that Teddy Crowley would not allow any women aboard."

That settled the matter, for at this moment Doctor DePolac entered the room and greeted Ralph.

"Is everything set, my boy?" he asked.

"Yes," answered Ralph. "We leave at noon, day after to-morrow. Are you ready?"

"I am," said the doctor, leading the way into his private office, where he motioned Ralph to a chair opposite his own. "I shipped one of the electro-telepathoscopes to Lakehurst by air freight and it should have been received by this time. All of my affairs here are in shape so that things can go on satisfactorily during my absence. My family raised strenuous objection at first, but are now reconciled, so I have nothing to hold me. I suppose you are prepared as well, are you not?"

"Nearly," said Ralph. "Of course I have a few things to straighten out in the city, but my business affairs are mostly taken care of, and it was only minor personal matters and the packing of a few more clothes that required my return to the city at all. I am getting anxious to start."

"So am I," said the doctor. "It seems to have rejuvenated me and I am looking forward to the trip with all the eagerness of a youngster first leaving home. Well, two days is not long to wait."

They talked for some considerable time, Ralph telling the doctor of all important events of the past month and describing the Comet to him in detail.

IN the outer office Margaret Sprague thought hard and fast. Ralph had told her of the possibility that Sorenson would use the trip as a means of obtaining wide publicity for his concern and Margaret thought at once of her childhood friend, Mary Holmes, now one of the best known news reporters in New York. Margaret was determined that she would make this trip to Venus, and she thought there was a possibility that her friend Mary might help. With sudden resolve she opened the door to the doctor's office and addressed him.

"May I leave for the remainder of the day, Doctor?" she asked. "I have a rather bad headache and should like to get home early."

"Why certainly, Miss Sprague," he agreed. "And I hope the headache is relieved very shortly. They are miserable things to have. Good-night."

"Good-night, Doctor," she said, "and thank you."

Ralph watched her trim figure as she turned to leave. "Good-night, Miss Sprague," he ventured.

She turned at the door. "Good-night, Mr. Prescott,"

she smiled. The room seemed darker as she closed the door behind her and Ralph flushed when the doctor looked at him with a quizzical smile.

"Well, well," said the doctor. "Is this a budding romance? Don't you take my secretary from me, young man."

Ralph laughed. "Not much danger," he said. "A beautiful and talented young woman like Miss Sprague can do ever so much better than to choose a mediocre dry-goods merchant like myself."

"I wouldn't be too sure if I were you," countered the doctor. "And I'm warning you not without reason. The young lady has inquired about you on several occasions."

Ralph flushed once more and the doctor grinned delightedly over his discomfiture.

Their talk once more turned to serious channels and it was quite late in the afternoon when Ralph took his leave and left for his own apartments. When he passed through the outer office on his way out it seemed in some way to be greatly altered and a far less pleasant place than it had been previously. He missed the presence of Miss Sprague and was surprised to find that she had made such a profound impression on him in so short a space of time.

WHEN Margaret Sprague left her own office she hurried to the building which housed the offices and editorial rooms of the *Evening Blade*. Here she inquired for Mary Holmes and, to her delight, found that her friend could be seen at once.

"Why, Margaret dear," said her friend in a pleased voice, when she was admitted to the office, "this is the first time I have had the honor of a visit from you in my own little workroom. And I'm so glad to see you. Do have a seat and tell me at once what brings you here."

The two girls embraced and Margaret made herself at home immediately. The contrast between them was vivid; little, sparkling Margaret with her dark hair and eyes and vivacious smile was the direct opposite of the taller, blond reporter. Mary's was an aloof, statuesque beauty, but it was none the less apparent by comparison with her friend. She radiated good-fellowship and wholesomeness. Her great blue eyes were as innocent of guile as they were wise and gentle. Her smile showed teeth of beautiful whiteness and regularity.

"Oh, Mary," her friend babbled, "I have the most exciting news and I want you to help me. Will you?"

"Of course I will, if I can," was the ready reply, "but first tell me what it is that has you so worked up and what I can do to help."

Margaret told her story with great excitement and her friend listened with attention and with growing interest.

"What a scoop that would be for the *Blade!*" exclaimed Mary when the tale was finished. "But what have you in mind? How can I help?"

"You and I are going on that trip," replied Margaret.

"What?" cried Mary. "You must be out of your mind. Why, they would never consent to our going along."

But the reporter's eyes snapped in anticipation. "It would be a lark, though," she continued. "And what a story it would make. Got any plans?"

"I had thought of approaching this Sorenson," said Margaret. "He is fond of publicity and will undoubtedly arrange to have representatives of the press at the hangar when this vessel makes its start. But I'll wager he has not thought of sending a newspaper representative on the voyage. Let's you and me take an early air liner and make a social call on the old gentleman. Maybe we can vamp him into sending us along."

Mary smiled at her friend's eagerness. "Well, that's an idea," she admitted. "And I'm with you. Things have been altogether too quiet hereabouts for a long time and I'm getting rusty with inaction. When do we start?"

Margaret clapped her hands with glee. "Oh, I knew you wouldn't fail me, Mary," she said. "We'll take the seven o'clock. That will give us plenty of time in which to dress our best. Come on."

SO it was that, less than three hours later, John Sorenson's butler brought to him a card bearing the legend "M. Holmes, Special Representative, *The New York Evening Blade.*"

He put down his evening paper and scanned the card thoughtfully. "Someone has talked to the newspapers already," he said. "Show the gentleman in, Hutton."

"It is not a gentleman, Sir," answered the butler. "There are two young ladies in the foyer. One of them presented the card. Shall I show them in, Sir?"

"Young ladies?" said Sorenson, in surprise. "Yes, show them in, anyhow."

A moment later he arose to greet two of the most charming young women he had ever met. His expression betrayed his wonder at receiving the call and Mary Holmes enlightened him at once.

"Mr. Sorenson," she said, "I am Miss Holmes, feature writer for the *Blade*, and this is my friend, Miss Sprague."

"It gives me great pleasure to make your acquaintance, ladies," said Sorenson gallantly. "But may I inquire as to the purpose of your visit?"

"I should like to ask for an exclusive contract with my paper to publish first hand news of the initial trip of the Comet, the vessel now being constructed by your concern in Lakehurst," said Mary boldly.

Sorenson was greatly taken aback. "Why," he asked, "how on earth did you learn of this vessel and its proposed trip?"

Mary smiled. "There is nothing mysterious about it," she replied. "Miss Sprague is Doctor DePolac's secretary and she learned of the plans in his office. We wish to accompany the Comet on her voyage and I will plan to write up a complete story of the trip for exclusive publication in my paper. Is that asking too much, Mr. Sorenson."

"Isn't it rather unusual for a woman to be assigned to a thing of this sort?" he asked doubtfully.

"Not at all," Mary replied. "I have had much more dangerous assignments. In fact, I have been in the midst of serious industrial disorders, and was even mixed up in one of those sporadic revolutions in a South American Republic."

"But why should Miss Sprague be included?" he objected.

"She is my dearest friend, Mr. Sorenson, and I should like her with me as a companion. I understand that all other members of the party are to be men, and it would surely be much more pleasant for me to have a female friend aboard."

"Yes, that is undoubtedly true," said Sorenson slowly. "But, my dear Miss Holmes, do you realize what you are asking? Do you appreciate the fact that the Comet, if it should reach Venus, may encounter grave dangers, that you may never return to this earth?"

"I realize that," she replied, "and so does Miss Sprague. But that does not alter our wish to go. Neither of us has any fear in the matter and we will be very glad to sign statements releasing your concern from all responsibility in the matter. I might also point out to you that my paper is the widest circulated American newspaper and is considered the best advertising medium in the world. The publicity would be of enormous value to you if this trip is successful."

"That is true, Miss Holmes. But I am afraid that my engineer, Mr. Crowley, who has all arrangements in hand, would object strenuously to taking women on this jour-

ney. I know he has every confidence in its success, but I believe he expects to have some troubles in which he would hesitate to involve two such charming ladies. I should hesitate very much to overrule his wishes in the matter."

"But," said Mary Holmes, "if you will only give your consent, I shall endeavor to win Mr. Crowley over. If he refuses we shall give up the idea. Will you consent on this basis?"

"Why—I suppose so," he hesitatingly agreed, "that is, provided your employers confirm the arrangement."

"Oh, they will, Mr. Sorenson. I shall return with a contract for your signature, properly drawn up by the officials of the *Blade*."

She and Margaret exchanged triumphant glances as Sorenson frowned in anxiety.

"Very well, then," he said, "although it goes somewhat against the grain to allow you two young ladies to embark on this risky enterprise. Of course, I appreciate that times are greatly different from what they were when I was a young man and that woman has entered man's previously undisputed place in almost everything. But I shall never forgive myself if anything happens."

The two girls thanked the financier profusely, and, wishing to waste no time, asked for directions for reaching Mr. Crowley.

"I'll take you to him myself," he offered. "To-night he is at his own home for a change and we can run down there in a very few minutes in my aerocab. Will you come now?"

"Thank you so much," exclaimed the two girls as one. "That is very kind of you."

Sorenson smiled at the spontaneity of the unrehearsed duet and immediately rang for his man.

TWENTY minutes later Teddy Crowley was surprised by a visit from his employer, who proudly presented the two beautiful girls he had brought with him. He was still more astonished when he learned their mission and would not at first hear of the proposition. But Mary's blue eyes were more effective arguments than mere words and he finally gave in to their pleading and agreed to make arrangements for accommodations for the girls on board the Comet. It was further agreed that they should be smuggled aboard without anybody's knowledge and, so to prevent talk and idle recrimination, their presence was to be kept secret until the vessel was well under way. This last arrangement was made at the suggestion of Margaret Sprague, who privately entertained some fear of strenuous objection on the part of Doctor DePolac and Ralph Prescott.

After his visitors had left, Teddy scratched his head in perplexity. He could not understand how on earth he had ever been prevailed upon by these artful females to agree to a thing which was absolutely at variance with his better judgment. But he had given his word and there was no backing out now.

When the girls were finally seated in the air liner which was to bring them back to New York, they talked long and gleefully of their victory. Mary was now as excited over the prospective journey as was her friend, and their flights of fancy, as they talked over their plans, would have done credit to a Jules Verne or a Münchhausen.

Margaret returned to her room in Brooklyn and packed most of her belongings before retiring. When she had prepared for bed she gazed at her reflection in the mirror before turning off the lights. She winked roguishly at herself and exclaimed aloud:

"Now, Mr. Ralph Prescott! We'll see what we'll see! Try and discourage me, will you?"

As she crept between the sheets and snuggled into her pillow, she chuckled contentedly.

CHAPTER VIII

The Voyage

ON the morning of the day set for the departure of the Comet a small aerocab alighted at the entrance to the hangar just before dawn. The guards were astounded to see that the passengers included two remarkably attractive young women, accompanied by John Sorenson and Teddy Crowley, as well as a considerable array of baggage. They were further surprised to learn that the young ladies were to embark on the Comet. But they were accustomed to seeing strange things and did not need much persuasion to hold their peace until after the new vessel was under way.

The two girls were enchanted with the double stateroom to which they were assigned and, after being left to themselves, gleefully set about putting away their belongings and rearranging the handsome furnishings of the room to their own satisfaction. It was to be their lot to remain in these quarters unseen until the voyage had begun. But they were so enthusiastic over the prospect of the adventure that they did not mind this in the least.

Within the hour many aerocabs began arriving at the great field before the hangar. Doctor DePolac and Ralph Prescott came together. Professor Timken and Captain French were the next to appear on the scene. Teddy's foreman, Steve Gillette, came to beg for permission to accompany the adventurers. He was one of Teddy's most trusted and valuable men and, after a hasty consultation with John Sorenson, he was given the coveted permission. Most of the other arrivals were gentlemen of the press, reporters and cameramen, whom Sorenson had advised to be present to witness an unusual development in aircraft construction. The secret had been well kept, but by mid-afternoon every newspaper in the country would be heralding the news that a new ship of the Sorenson Aircraft Corporation had set forth for a trip into the heavens—exact destination unknown. The ultimate purpose of the voyage was not to be divulged. That could wait until the return of the adventurers with proofs, and until the work of Mary Holmes should have been completed. John Sorenson would obtain sufficient publicity for the present and his competitors would have no opportunity of ridiculing a harebrained undertaking. And how confounded they would be when the Comet did return and brought news of Venus! John Sorenson had planned his advertising well.

Soon the great doors of the hangar commenced opening very slowly and the cameras of the newspaper people began clicking. John Sorenson dashed from one to the other excitedly. He was the only remaining spectator beside the newspaper men. The passengers had entered the Comet and she was ready to proceed on her journey.

As the doors swung wider and wider open, there became visible within the huge building the shining bulk of the Comet. It was a beautiful object, glistening in the early morning sun like a huge silver ball.

From within there came the rising whine of rapidly revolving machinery and, slowly the gleaming ball arose from its cradle to the distance of about ten feet—then poised as if to make a final decision. Ropes had been attached to the sphere and, by means of these, the four guards of the hangar and the few remaining workmen were easily able to tow the now weightless sphere into the open air, where there was a great scurrying of the reporters and cameramen to obtain better points of vantage. John Sorenson strutted like a turkey.

Through the lower windows of the control room could be seen the six male passengers—Teddy Crowley at the controls. They waved and smiled farewells, as, with an increase in pitch of the whine from within, the Comet rose rapidly and drifted toward the west. With the cameras still clicking furiously and the watchers waving

frantically, the speed of the sphere increased with constant acceleration until, within a very few minutes, the Comet was a mere speck in the western sky. Then she was gone entirely and an involuntary cheer rose from the spectators.

The journey had begun.

In the control room of the Comet great excitement prevailed as Teddy manipulated the numerous controls and the speed of the vessel increased until it was terrific. The earth fell rapidly away from beneath them, and Teddy assured them all that everything was operating without a hitch. The reversal of the earth's gravitational effect was now complete and the acceleration was at a rate beyond belief. Within a very few seconds the outer limits of the atmosphere were left far behind and the Comet hurtled through space with terrific velocity. All eyes were on the speed indicator as the needle steadily traveled over its dial. The earth beneath became a quickly receding ball. The myriads of stars in the now pitch-black firmament assumed a brilliancy never observed on earth. The speed indicator registered two thousand miles a second when Teddy made the necessary adjustments to maintain it at that point. He turned to Professor Timken.

"Professor," he asked, "what is the distance to Venus at this time as determined by your calculations?"

"Eighty-eight millions of miles," replied the professor, "and at this rate of travel we should reach it in less than thirteen hours."

"Well, in that case, said Teddy, "I believe I shall not exceed the present speed. There is no need of overtaxing the capabilities of the Comet on her maiden voyage."

"How about our direction?" asked the professor.

"I shall leave that to you," said Teddy. "You are better able to use the instruments than I am."

THE professor then sighted through a shining brass instrument that resembled a surveyor's transit, excepting that it was built on a much larger scale. He issued a few terse instructions and at each word Teddy touched a button here, a lever there until finally the professor advised that they were headed properly.

"Now, how about some breakfast?" said Teddy. "None of us has eaten and I, for one, am feeling hungry. Everything can remain as it is for several hours. The sole fly in the ointment is that we shall have to serve ourselves, since we have no crew besides our six selves."

"But suppose a meteor or a small planetoid crosses our path?" objected the professor. "The vessel would be injured, perhaps destroyed."

"You forget," said Teddy, with a smile, "that our vessel is operated by gravity and repulsion. The approach of any such body is recorded by a very delicate instrument of my devising and immediately automatic controls come into play. These controls vary the attracting or repelling effect on the proper sections of the super-silicon steel hull and we are deflected from our course for a sufficient distance to pass safely the dangerous object. Our course is then automatically restored by the same means."

"You certainly have taken care of every possible emergency," said the professor admiringly. "I am quite willing to follow your suggestion regarding the food. I suppose the others are also."

The other four men assented, Steve Gillette with especial fervor.

When they had mounted the two flights of stairs to the dining saloon, all but Teddy were astonished to find a perfectly appointed table set for eight people.

"What's the idea, Teddy," asked Ralph Prescott, "I thought you said there was no crew on board. Who prepared the meal?"

Teddy grinned mysteriously. "Oh, I have a little surprise for you," he said. "Just seat yourselves, everyone, and prepare to enjoy some real eats, properly served."

Without further ado the six men seated themselves and all noted the two empty chairs which they at once assumed, and rightly, were for the mysteriously absent crew. At each plate there was a half grapefruit, appetizingly prepared, and the hungry passengers set to with gusto.

Ralph Prescott was greatly excited, perhaps more so than any of the others, because he possessed the least amount of scientific knowledge of all. He made as if to ask a question of Teddy, who occupied the place at the head of the table. As he looked up, his eyes rested on the door that communicated with the galley. Immediately he jumped to his feet, almost upsetting his plate as he did so. His eyes seemed to bulge from their sockets as he saw the charming figure of a black-haired, smiling girl in the doorway.

"Margaret," he spluttered, growing red in the face, "how on earth—what kind of a trick is this?"

Doctor DePolac was likewise thunderstruck and gazed aghast at his erstwhile secretary.

Margaret Sprague smiled archly at Ralph. "Mr. Prescott," she said evenly, "I have been my own mistress for years and I don't propose to have a master now. And don't look at me so angrily."

"But—but, Margaret," he objected, "this trip is extremely dangerous."

"No more so for me than for you men," she said calmly, "and I think you are very rude not to present me."

The doctor joined Ralph in vigorous objection to Miss Sprague's action but the two men soon realized that nothing could be done about it. Teddy grinned appreciatively from the head of the table. The professor shook his head solemnly, while Captain French and Steve Gillette gazed with unconcealed admiration at the girl in the door. The group was further astonished at the appearance of another beautiful girl, when the stately Mary Holmes thrust her blond head from behind the raven locks of Margaret Sprague. The two girls laughed merrily at the discomfiture apparent on the faces of all of the men except Teddy Crowley.

Those peals of silvery laughter quickly softened the faces of the men and it was not long before the breakfast had developed into a sort of a party, with each and every one of the six men striving for the privilege of assisting the girls in the culinary work and the serving.

But Ralph still entertained vague forebodings, as did Teddy.

AFTER that first meal on board the Comet, the party separated quite naturally into several groups. The two girls were annexed by Teddy and Ralph, who took them to the various portions of the vessel, and poured into their eager ears equally eager explanations of the functioning of the various mechanisms, and of the method of propulsion. Doctor DePolac joined Professor Timken in the control room, where the two older men exchanged views of their differing branches of science. Steve Gillette and Captain French found their chief interest in the central power plant, where Steve lovingly expounded on the qualities of each machine, on all of which he had spent so much of his time during the construction of the Comet.

And, quite naturally too, the mixed group soon divided. Mary Holmes become greatly interested in the refrigeration system and Teddy lingered to explain and demonstrate it to her. Margaret Sprague displayed vivid interest in the beauties of the firmament, through which they were rushing with such tremendous speed. It was thus that Ralph found himself leading her into one of the side compartments where they took up their position at one of the circular windows.

"Miss Sprague," he said, "I do not know any astronomy, outside of the little I have picked up in my short associ-

ation with Professor Timken. But, like you, I am greatly interested in it and strongly appreciative of the vastness and beauty of the universe."

"I was Margaret to you at the breakfast table," she countered, irrelevantly.

Ralph hesitated. Then, "But my words were spoken under stress at that time," he apologized. "Forgive me if I offended you. And nothing would please me more than to have your permission to call you Margaret."

Her laughter at this thrilled him anew. "Why, certainly, I forgive you. And you may address me as Margaret—I—I—rather like it—Ralph."

The ice being thus broken, they talked long and earnestly of their mission. These two, bachelor and bachelor maid, found much in common. Both had been thrown on their own resources and had proved equal to the emergency. Gradually, as he came to know her better, as he saw deep into the courageous spirit of the girl, his fears for her safety were allayed, or at least mitigated. She was so self-reliant, so energetic in her opinions, that he could not picture her as being unable to face almost anything with bravery equal to that of a man. So, with her, he gave himself over to awed contemplation of the heavens. Then fell into silence.

Below, in the control room, the professor had just taken another observation and found their course still true. The velocity remained constant and by his reckoning almost half the trip had been completed. Suddenly there was a clicking of relays in a glass case beside the main control board. There came a change in the murmur of the machinery overhead and, with a lurch that threw the professor and the doctor sprawling to the floor, the Comet changed her course. When they had picked themselves up from the floor, the doctor looked wonderingly at his friend.

"Just the operation of Teddy's automatic device to save us from some disaster," explained the professor. "But I wonder if any of the others were hurt by the shock. It was quite severe."

"Indeed it was," said the doctor, ruefully rubbing a shin which had contacted painfully with one of the control levers.

They were assured almost at once regarding the safety of their companions, who, one and all, rushed down the stairs to the control room. Steve Gillette and Captain French were a bit pale, since they had witnessed the sudden speeding up of the several units in the power room, and there the shock had seemed even more terrific. But the two young women and their escorts seemed unconcerned enough as far as fear went; they only wondered about the cause of the disturbance.

Teddy stepped at once to an array of instruments at one side of the room. As he did so the professor uttered a startled exclamation. He had glanced at the speed indicator.

It registered twenty thousand miles a second! No wonder there had been a shock! Their velocity had increased ten times in less than two minutes of time!

"What is it?" asked Mary.

Teddy returned from the instrument board. "Some celestial body approached us in the direction of hull-section 326-R," he replied, "and it was necessary for the Comet to run away. But all will be well. And possibly we may see the heavenly wanderer. It should be visible through yonder window."

He pointed to a near-by port and the passengers trooped to that point, gazing intently into the heavens.

ALL appeared as before. The stars shone in all their glory. Venus gleamed with the brilliance of a planet far larger than any they had ever witnessed with the naked eye. But there was no sign of a large near-by body which might have caused the disturbance. They watched for not more than a minute when there was another convulsive lurch of the Comet. This time they were not thrown to the floor, but were rather seized with a slight nausea and feeling of light-headedness. Immediately Margaret uttered a surprised exclamation. She was floating in mid-air, fully three feet from the floor, clutching for support. Ralph reached for one of her outstretched hands and, having moved a bit too quickly, found himself in about the same predicament. The sight was so ludicrous that the other voyagers burst into laughter, Ralph and Margaret soon joining in the merriment for all their undignified plight.

"None of you must move from your present positions," laughed Teddy, "I think I know what has happened and I shall remedy the trouble at once."

He stepped out slowly, carefully, and moved toward the door. Each shuffling step moved him several feet so that he seemed to be gliding over an undulating, flexible medium. He worked his way up the stairs, leaving the rest gazing foolishly at each other.

"Something has happened to the internal gravity-simulating apparatus," announced the professor, carefully holding to the nearest control pedestal to keep his featherweight body in position. "You know it was necessary on this vessel to provide for energization of the floors in order that we might maintain our normal weight with relation to the vessel itself. Otherwise we should be practically weightless as we are now and should be unable to move about normally. Of course the ship itself has some mass, but this is so infinitesimal when compared with that of the earth, that its attraction for our bodies is almost nil. Therefore, we now weigh practically nothing."

"How interesting," giggled Mary Holmes, "and here I have been on a reducing diet for six months and have only lost three pounds."

The doctor guffawed at this. He had a daughter whose inclinations were similar and who thought more of calories than of any other single thing on earth.

Margaret and Ralph suddenly floated to the floor and each member of the party felt the floor plates pressing gradually harder and harder against his feet until normal weight was restored.

Teddy bounced down the stairs laughing. "Well, folks," he said, "I guess we are all right again now. One of the gravity energizers had stopped and I started up the spare generator, so all is well once more."

"But what caused the first one to stop, sir?" asked Steve, in surprise.

"That puzzles me," said Teddy, his brow wrinkled in perplexity, "and I hope nothing serious has happened to it because we have only the one spare."

"I'll go up and look it over right away," said Steve, suiting action to the words.

Teddy glanced at the speed indicator, which again registered the normal speed of two thousand miles a second. The professor sighted through the direction finder and announced that they were again on their course. But no body which could have caused the disturbance could be seen through the window in the direction from which the influence had come.

"This is strange," murmured Teddy in a puzzled manner, "I can not understand it, but everything seems to be all right again and that is the important thing."

"I believe I can explain it," said the professor, "the body causing the Comet to swerve from her course to avoid collision was quite possibly a meteorite of considerable size."

"But why could we not see it?" objected the doctor, "I thought meteorites were what we call shooting stars?"

"They are," replied the professor, "but meteorites are comparatively small in size and only become visible to us on earth when they enter our atmosphere and become heated to incandescence by friction with the air. Out

here in the vacuum of space they do not become heated, and, on account of their smallness and consequent lack of light-reflecting surface, are invisible to the eye from any appreciable distance. This is quite likely the reason we did not, or cannot, see the object which deflected us from our course."

"But this meteorite must be of considerable size to operate my automatic devices to such a violent extent," said Teddy.

"Size is only relative," answered the professor. "Some of the meteorites which enter our atmosphere are small enough to be held in the hand, could one be obtained. But these smaller ones are entirely consumed by the heat of atmospheric friction before reaching our earth. Larger ones do reach the surface and these are called meteorites or aerolites. Some of these have been found to weigh many tons and these were probably much larger before entering the atmosphere, a great reduction in mass taking place in their brief but fiery transit through the increasing density of the air. As a matter of fact out here in space one might easily be as large as our vessel and would then have many times the mass or attracting power of the Comet. If of sufficient density, one could well be imagined to weigh many thousands of times more than our ship, and in that case its action on your delicate mechanisms would be intense."

At this juncture Steve Gillette entered the room. "Well, the energizer is off the sick list," he announced. "I have repaired it."

"What was wrong, Steve?" asked Teddy.

"Why, it's the darndest thing," said Steve. "The field was completely demagnetized."

"What did you do?"

"Just connected up a couple of leads from the main generator and passed a heavy current through the field coils of the energizer. This soon remagnetized the steel core pieces and now the machine is as good as new."

"Good stuff," Teddy approved, "but I can't tell you what caused the trouble either."

The professor spoke up at this. "I think I know," he said. "The meteorite we passed, or which passed us, must have been a highly magnetic, or possibly even a radio-active body. Many meteoric specimens have been examined on earth and a considerable proportion of these were found to contain iron in the metallic state. Even where pure iron is not found, some of its compounds are usually present. About three and a half percent of the specimens are nearly pure iron combined with a small percentage of nickel. Within the past two years one of great size was found which was highly magnetic, something of the nature of lodestone. Another had marked radioactive properties. It is thus quite easy to conceive of a still larger body possessing such qualities to an enormous degree when in its native element and unquenched by the incandescence set up in passage through our atmosphere. Concede this and the explanation is more or less simple. Emanations of a powerful magnetic nature could penetrate the inner insulating envelope of the Comet, though it is a complete protection against harmful vibratory rays, and set up oscillations in the particular field pieces which would demagnetize them as was accomplished in this instance. At least that is a rational assumption. And we are extremely fortunate that the energies that simulate normal gravity in the Comet are interconnected with this automatic device and are instantly altered or shifted to compensate for a rapid acceleration of the vessel. Otherwise we should all have been flattened to the floor plates and killed when this occurred."

WITH their minds once more at ease, the voyagers again paired off in much the same manner as they had done previously and the remainder of the trip was spent pleasantly and without untoward incident. The second meal of the day was an even more jolly one than the first and it was easy to be seen that already firm friendships had been established in the group. Especially was this true of Ralph and Margaret, who indeed seemed to have reached something stronger than a mere friendship. True, also, was this of Teddy and Mary. And it was plain to the rest of the voyagers that the two couples had found strong mutual attraction. This was observed by Steve and the captain with something akin to envy, and by the older men with tolerant approval.

THE Comet had left Lakehurst at exactly seven-thirty in the morning. At five-thirty in the afternoon the professor made an observation which showed them to be approximately fourteen million miles from their goal. He was somewhat puzzled at first, since, at the rate of two thousand miles per second, there should still remain about sixteen million miles of their journey. But he recollected the three minutes or more when their speed had been multiplied by ten, and readily calculated that this accounted for the discrepancy, since they had not swerved widely from their course at the time. He therefore announced that at the present rate of speed only two hours remained of the trip.

At six-thirty, by earth time, when the evening meal had been completed, the entire party assembled in the control room. Only about seven millions of miles now separated them from Venus, which could be seen through the floor ports as a fair-sized ball, rapidly growing larger. The color of the planet revealed itself as a cold blue-white, almost of the nature of the earth's satellite on a clear night. The group watched it in awe, not unmixed with excitement.

Observations were taken at ten-minute intervals and the excitement increased apace as the disc of the planet loomed larger and larger to their view. Teddy now stationed himself at the controls permanently and the professor remained at the direction finder. The others knelt about the floor ports with their eyes glued on the great orb they were nearing.

"Isn't it beautiful?" whispered Margaret, whose head was close to Ralph's.

"More than beautiful," he replied. "And, do you know, it seems to me that the color is changing to a more greenish tinge than we first thought."

"I believe so, too," said Margaret. "What does that remind you of, Ralph?"

"Why," he said, "I had not thought of it, but now you mention it, it does bring to mind the green mists accompanying the mental messages sent to me on earth."

He looked at Venus in awed silence.

Minute by minute the planet loomed larger and soon a decrease in pitch of the whirring machinery over their heads told that Teddy had started the deceleration of their velocity. They were approaching less and less rapidly now and, when the globe beneath them become so great in size as to fill their entire field of vision, the Comet had slowed down to a mere half mile a second.

The greenish tinge persisted for a time but when they had entered the atmosphere of the planet and the Comet slowed down still further, the green seemed to vanish utterly. In a few minutes they realized they were in broad daylight, with the sun high in the heavens shining as naturally and familiarly as on their own earth. Its disc appeared much larger than on earth but the illumination was not much greater on account of the greater filtering effect of the atmosphere. Now they plunged through a bank of light clouds and before them spread a wonderful sight. The planet was no longer a globe, but a great bowl, with the horizon as its rim.

"Ladies and gentlemen," said Teddy, with mock pomposity, "allow me to present to you the planet Venus."

No one replied. They were far too absorbed in the magnificent view.

CHAPTER IX

Venus

THE Comet drifted slowly above the surface of the strange planet at an altitude of about twenty thousand feet, giving the voyagers ample opportunity to study its characteristics from comparatively close range. As far as the eye could reach the prevailing color was green, not the yellow-greens and deeper hues of the foliage on earth, but a clear, glistening blue-green varying in shade from a beautiful emerald to a delicate jade. Off to the north (the magnetic compass of the Comet was now operating, and showed Venus to have a magnetic pole similar to that of the earth) rose a range of mountains, partly obscured by a pale blue-green haze in spots but showing flashes of royal purple and of gleaming scarlet here and there. In the distant east could be made out a large body of water, evidently a great sea. The landscape was dotted with communities appearing, from this height, similar to those of the earth. The countryside between was marked with orderly patches of what must have been cultivated ground, the whole presenting the appearance of a huge checkerboard painted by an artist with a flair for the modernistic in variety of shades of the same basic color.

But there were no large cities in evidence so Teddy headed the Comet in an easterly direction, his idea being that the sea coast would be the most likely place on which to find large centers of population. He dropped to a lower altitude, about five thousand feet, and here much more could be seen in detail, though the view was more limited in area. Straight ribbons of highways could now be seen and these seemed to be crowded with high speed traffic. The surfaces of the roads were themselves of a greenish hue, which accounted for their being unseen from higher altitudes.

"Is everything on this dog-gone planet green?" grunted Steve Gillette.

"It looks that way, doesn't it?" laughed Teddy, "although we did see flashes of purples and reds in the distant hills. But what I am wondering now is where we are going to land."

"Why not just land anywhere and inquire for this Queen Thalia of Ralph's?" inquired Margaret sweetly.

Ralph grinned sheepishly at the sally, but was secretly pleased at the evident note of slight jealousy.

"That might not be safe," spoke up the doctor. "We have no means of communicating with these people. We do not know their language nor do they know ours. Besides, for all we know, this world may be very much like our own, with many separate states or countries, each suspicious of, and occasionally warring with, the other. We might easily find ourselves in territory hostile to this Thalia."

"But Thalia's communicated thoughts gave the impression that she is ruler of the entire planet," Ralph objected.

"True," agreed the doctor, "but rulers of our earth often sit on uneasy thrones and the same thing may be true here."

At this moment the voyagers were surprised by the sudden appearance of a large airplane, almost a duplicate of those in use on earth some twenty years previously. This plane circled the Comet several times, its occupants scanning the vessel through goggled eyes. Then it made off swiftly in a northeasterly direction. They had not seen an aircraft of any description previously and had wondered why the people of Venus were not using the air instead of the green roads below. Here at least was one field in which the people of earth excelled them. And to them the craft which inspected them appeared strangely antique, though it was of large size and very speedy, as airplanes of its type went.

"Did you see what I saw?" exclaimed Teddy, "or do my eyes deceive me? When that plane was close to our windows it seemed to me that the pilot and passenger were of huge size."

"They certainly were," said Ralph, "I should judge them to be at least eight feet in height, though it is hard to tell with the lower halves of their bodies hidden in the fuselage. It seems we are to encounter a race of giants. And you will remember that the queen, Thalia, gave the impression of being very large when she appeared in the mental vision received on earth."

"That's right," said the doctor. "I am not sure why that impression was evident but it certainly was. Perhaps it was by comparison with more familiar objects surrounding her in the vision. But I was sure at the time that she was of much greater stature than our own women."

"Well, that'll be some consolation to me," said Mary. "I have always thought myself too tall for worlds, at least for our world. It will be pleasant to find taller women here."

Teddy smiled in her direction. "There you go again," he said. "You're just right as you are."

Mary blushed and the others laughed.

"Look!" exclaimed Ralph, "here comes a whole fleet of the planes."

IT was true. From the direction in which the first one had disappeared, there came a fleet of twenty-eight of the airplanes. They flew in formation, seven planes to a group, flying in V's. Just as the first one had done, these circled the Comet several times, then made off toward the northeast. They moved but a short distance and then returned, repeating this maneuver several times.

"What dumb-bells we are!" exclaimed Teddy, "they are trying to let us know we are to follow them."

He manipulated the controls and the Comet followed in the wake of the fleet of planes. As soon as he had done this, the fleet speeded up and continued in the direction they had taken. They flew at an altitude of no more than three thousand feet and the speed indicator of the Comet showed a speed of four hundred miles an hour, when they were just maintaining their position.

Soon they were over the sea that they had noticed before and it proved to be one of the strangest bodies of water they had ever seen. Its surface was as smooth as that of a lake though its size must have been immense, for it was not many minutes before no sight of land could be had in any direction. But the color of this ocean was the strangest part of all. Instead of the usual ultramarine of the oceans on earth on a clear day, this body of water was as black as the blackest ink. The sun was reflected on its surface in glints of purple and blue and orange that reminded one of the multi-colored glints of carborundum crystals. The horizon in all directions was shrouded in the elusive green mist. The sky above, instead of showing the deep blue of the earth's, showed an equally deep and beautiful green. It was a strange world they had reached.

"What strange hues and shades!" exclaimed Margaret. "One would almost think that this world had been deliberately created for the purpose of presenting vivid and unusual color combinations. But it is weirdly beautiful all the same."

"Indeed it is," Mary agreed, busy with her notebook, "my editors will scarcely believe their senses when they read my copy."

Hour after hour the Comet trailed the fleet ahead and it soon became apparent that they were in for a long journey. The view of the gleaming black ocean became

very monotonous and it was not long before Captain French proposed a game of bridge. This was readily agreed to by Margaret and Ralph, but Mary could not be persuaded to leave the control room. Steve Gillette finally agreed to play and the four proceeded to the smoking room above. Doctor DePolac and the professor left for the upper compartment where the professor proposed making some observations with his sextant and to prepare a rough chart of the portion of the planet's surface over which they traveled. This left Mary alone with Teddy in the control room, which was entirely to the engineer's liking.

"How do you get that way?" asked Teddy as soon as they were alone, "always worrying about your diet and forever complaining of your height. Why, I'll bet you are no more than five feet nine."

"Nine and a half," she corrected, "and I can't get below a hundred and forty to save my life."

Teddy snorted. "Why, that's terrible, isn't it?" he said, "and I'm over six feet and weigh nearly two hundred."

"Yes, but you're a man. All my girl friends are little and pretty like Margaret, and here I am a great big horse, fit for nothing but taking a man's place in the newspaper world."

Now Teddy became really angry. "Mary," he growled, "I have only known you a short time, but I must speak my mind. You make me tired with that kind of talk. Haven't you ever looked in your mirror? Haven't you ever observed the beauty you possess? And don't you know that the slightly taller women wear clothes far more effectively than the little runts? I think you are the most beautiful women I have ever seen."

And indeed she was beautiful as she sat beside him, chin in hand, watching the gleam in his eye as he made this statement.

"You're a dear, Teddy," she said, "I thought I'd get a rise out of you and I did. Actually, I don't give a hoot about the things I have been talking about. But I do care about your opinion. This is an age of frankness between the sexes and I am telling you that I have never before been attracted to a man as I am to you. I hope the feeling is mutual."

"It certainly is, Mary dear," he replied in a much softer tone. "Perhaps I am attracted far more than you are. And I know we shall be happy when we marry."

"Is this a proposal?" she asked.

"Positively!"

"Then consider it settled."

She arose and drew nearer as, with one hand on the control, Teddy reached for hers with the other. The pact was sealed with a kiss.

Neither of them thought of the affair as anything unusual. But had the doctor or the professor witnessed this scene they would have thrown up their hands in horror. They were of the past generation when the equality of the sexes was still in its infancy, when the younger generation had just begun the era of frankness and freedom. They still adhered to the old ideas of long courtships, shy glances, and the dominance of the male. But times had indeed changed.

THE Comet was now approaching the shore of some land, which loomed up ahead as a forbidding, mountainous coast. The fleet before them headed skyward, gaining altitude rapidly. Teddy followed, knowing they must have some reason for so doing. When they had reached an altitude of twenty thousand feet they flattened out and proceeded over the new country. And such a scene of desolation as spread before them!

Gone were the many shades of green witnessed in the land they had first sighted. The ground beneath them was as black as the blackest charcoal. It was broken up and disrupted until it was hardly recognizable as anything but a continuous waste of unbelievably ebon wreckage. It was not the blackness of the ocean just crossed, but the blackness of death and destruction. There was not a glint of reflected light from the sun, which was still high in the heavens. A gloom, an indescribable pall seemed to hang over this land and the very air became darker. No wonder the fleet had climbed to a higher altitude!

Mile after mile they traveled over this depressing territory. Mile after mile of broken and twisted mountains and valleys they crossed without seeing a cheering sign. There was not the slightest evidence of vegetation or of human or animal life. Then the fleet again gained altitude until the altimeter on the Comet registered thirty thousand feet. Soon they sighted, toward the east, and only a short distance off their course, a most unusual phenomenon, even for this unusual world. A great flaming dome appeared as if by magic. It hurled twisting, leaping streamers of searing blue flame for miles in all directions. It seemed to be a burning, boiling hemisphere of sulphurous fire, and its awesome light painted the blackness surrounding it in eerie, flickering color. Then it slowly died down, leaving only a blackened waste where it had appeared.

Mary pressed Teddy's hand still more tightly. "What, in Heaven's name, was that?" she whispered.

"Search me," he answered, a little shakily. "But I guess we will see stranger things than that before we leave dear old Venus. No wonder our guiding fleet came up to this height. If we had been at twenty thousand feet and one of these things sprang up below us, we should have been annihilated. No wonder Thalia called for help!"

"It's funny Ralph hasn't received another thought message from her, isn't it?" said Mary.

"Yes, I had thought of that too. When we first neared the planet and didn't know where to land, it seemed she should have come to our aid. But, come to think of it, her thought waves were projected over a directional beam and, with such a device, it would be impossible to keep in contact with a moving vessel like the Comet. That is probably the reason."

"But she was able to locate him in his movements about our earth," Mary said.

"That's so," agreed Teddy. "But anyhow, there's something about it none of us understands. It may be that there is great difficulty in obtaining the required contact. At any rate we seem to be well taken care of by the fleet up ahead there. And they make very good speed for planes of their type. But it is slow going for the Comet. We could rise above the atmosphere and encircle the entire planet in a few minutes. But of course that is impossible for them."

"Will you stop talking shop for a while now and pay some attention to me?" asked Mary, drawing closer to him.

"No sooner said than done," said Teddy, encircling her waist with his free arm, "but look ahead. There is the black sea again. This must be only an island we are crossing."

It was indeed the case and, within a few minutes they were again out over the inky waters. The sun shone more brightly and they both breathed a sigh of relief.

"I hope that not much of the planet is like that we just saw," said Mary.

"So do I," agreed the engineer. "I suppose the destruction we witnessed was the work of the enemies mentioned by Thalia and it sure was complete."

All through the afternoon they followed the fleet at the steady pace they had maintained, the professor spelling Teddy at the controls at meal time. The bridge game continued in the smoking room and it appeared that Ralph

was the big winner. But he wore a look of discontent, brought on no doubt by the fact that Captain French was paying a great deal of attention to Margaret. The professor was deep in his mathematics and had learned several interesting facts about the planet. Through ports provided in the upper compartment for that purpose he had drawn samples of the air and had determined its constituents. He announced that it contained almost exactly the proportions of oxygen, nitrogen, and other gases as that of the earth, but there was, in addition, an element unknown to him and which he could not place in the atomic scale. This, he thought, was the substance which gave the atmosphere of the planet its greenish tinge when viewed from a distance and it puzzled him greatly. But the air was pure and breathable and he had found the barometric pressure at the level of the sea to be 30.8 inches, slightly higher than that of the earth. Immediately after dinner he and the doctor returned to the upper compartment. The bridge game was resumed, and Mary and Teddy again had the control room to themselves. They had made far better progress than had Ralph and Margaret.

AT sundown a most beautiful sight presented itself. The sun, seemingly several times as large as seen from the earth, took on a purplish tint as it neared the horizon. The colors in the sky were indescribable and Mary hastened up the stairs to break up the bridge game and get the four players to view the beauties of this, the first sunset they had witnessed on the planet. Since the control room was provided with windows permitting a view in all directions except directly upward, the bridge players returned there with her.

The reflections on the inky waters were of colors entirely outside the experience of these visitors from another world and they gazed in speechless amazement. As the great disc of the sun was slowly swallowed up by the ebon waters, the play of colors and the shifting lights on the surface brought many a gasp of delight from the two girls. The sky changed gradually from its deep green tint to a brilliantly illuminated dome of flashing colors of brighter hue. The few clouds at the horizon were tinged with carmines, magentas, and purples. Strangely there was no hint of yellows, but never had the passengers of the Comet witnessed so vivid a display of most of the colors of the painter's palette. When the sun was entirely hidden the colors persisted, fading reluctantly with spasmodic flickerings of renewed brilliancy, as if they were loath to be extinguished. The twilight was green, pale at first, then merging into the several shades of yellow and of blue-green, through the deepest to the blackness of night.

For an hour they watched, awed into silence. Now the stars became visible, twinkling merrily and brightly. Ahead of them shone the many lights of the fleet they were following, and from several of the airplanes extended the beams of searchlights playing on the waters below as an additional guide to the visitors.

The card game was not resumed that night, as everyone, notwithstanding the excitement at the prospect of landing, was so tired as scarcely to be able to remain awake. There was no indication from their guides as to how long a journey might be ahead of them, and as the time grew late, the professor relieved Teddy at the controls, allowing him to retire for a few hours' rest. Captain French remained with the professor, and the remainder of the party withdrew to their staterooms to obtain some sleep. They had not slept for more than twenty-four hours and needed rest badly. It had been a long period of wakefulness for them all, for they had left earth early in the morning, and had arrived at about noon of a Venerian day, after twelve hours of travel.

Four hours later Teddy returned to the control room. He found it impossible to sleep longer. His anticipation had gotten the better of him, even in his sleep. He found that the captain had retired, leaving the professor alone at the controls.

"How are things going, Professor?" he asked.

"Nothing has occurred, Teddy. We have maintained our speed steadily and I figure we are now over six thousand miles from our starting point. And, do you know, I believe this planet is about nine-tenths water on the surface, possibly more?"

"Is that so?" said the engineer. "What brings you to that conclusion?"

"Well, we have now traveled more than one-quarter around the circumference of the globe and have been mostly over water. During the night we passed over two more islands similar to the barren one, except that these were populated—thickly, I should judge from illumination of the cities below. Four large air liners of the plane type passed within view and I saw one of these land on the second island. Possibly we shall reach a great continent later, but I am inclined to the belief that the surface is a great expanse of water, dotted with islands of greater or less size, with no immense areas of land such as the continents of our earth."

"Then the population here would be considerably smaller than that of the earth?"

"Undoubtedly. But, Teddy, I am becoming very tired and, if you don't mind, I shall turn the controls over to you now and get a little sleep myself."

"Go right ahead," said Teddy, contritely. "It was inexcusable of me to leave you here. You have had less sleep than any of us."

"Yes, but I was playing most of the day yesterday, while you did all the work," laughed the professor. "At any rate, good night."

"Good night, Professor," said Teddy, "I'll have you awakened as soon as anything of interest happens."

THE dawn came in little more than two hours, and its weird green brilliancy lighted the control room with flickering lights of eerie hue. Teddy had never felt more alone in his life, and he shuddered involuntarily as another of the blackened, blasted islands loomed up ahead. The guiding fleet increased altitude as before and the Comet followed immediately. This island was much smaller than the first and had evidently been the scene of more recent activity. Here and there were pools of blue flame from which great clouds of heavy yellow vapor arose. Two of the fiery blue domes appeared before the far coast of the island had been reached and Teddy wondered more and more as to their nature and origin. But no sign of life appeared, nor was there any indication that any existed on the barren wastes of the terrible land. He breathed a sigh of relief when the Comet was once more out over the dark ocean.

Mary and Margaret entered the control room soon after and looked as refreshed and rosy as two flowers. Teddy gazed at Mary admiringly and lovingly.

"Good morning, dear," she addressed him, cheerily, "what's the news this morning?"

"No news yet," he replied, "excepting that we are over seven thousand miles from our starting point and still going strong. It can't be much farther to where we are going as we are nearly a third of the way around the planet now."

"Isn't it thrilling, though, to think that we are really over the surface of Venus," said Margaret, "and will soon see what its inhabitants are like?"

"It is," said Teddy drily, "but it is going to be still more thrilling when we find ourselves again on good old mother earth. I hope no harm comes to either of you while we are here."

Mary kissed him affectionately on the forehead. "You

old fuss-budget," she said, "don't worry about us. We wouldn't be here if we didn't want to be. And we are going to get more fun out of it than will all of you men put together."

At that moment a huge air liner approached at high speed and passed them so closely that they could make out the figures of passengers on the decks. The girls rushed to the windows and waved their handkerchiefs in excitement. Their gestures were answered by like demonstrations from the passengers on the other vessel, which must have had a capacity of at least three thousand persons. And it was a giant ship with huge wings and great humming propellers. So different was it from the great wingless liners of their own earth that it seemed marvelous by comparison. And indeed, it was, for never had the winged type of airship been developed to such huge proportions on earth, although it might well have been, had not the gravity neutralizing material been discovered, so that the development of aircraft progressed along entirely different lines.

By the time the rest of the party was assembled in the control room another five hundred miles had been covered and land was in sight ahead. As they approached the coast the fleet slowed down, until they were traveling at not more than a hundred miles an hour. Soon they made out the skyline of a great city that sprawled along the shore for a distance of ten miles or more. From this city there arose a cloud of airplanes of all sizes and these came out to meet their convoy. Like a flock of excited birds they circled around and darted to and fro, some approaching the Comet within an unsafe distance to get a good look at the visitors from another world. The fleet and the disorganized welcoming craft circled the city twice, thus affording the passengers of the Comet a good view of the wonders beneath.

Such a city they had never seen—never imagined in their wildest dreams. It was nearly as large as their own New York and was teeming with life. The streets were laid out in orderly straight lines and were crowded with traffic. Great parks and public squares appeared here and there and the roofs of all buildings were flat and provided with runways for the launching of airplanes. The buildings, even in the business section, were not of as great a height as those of the large cities on earth, rising to not more than six hundred feet in most cases. But they were radically different in other respects from any previously seen by the visitors. They appeared like huge truncated pyramids with perfectly smooth, windowless sides. The streets and moving ways bordering them were of the same pale green tint as had been observed in the country roads, when they first neared Venus. The buildings were of many colors, brilliant in the extreme—purples, reds, and blues of vivid hue. It seemed that the inhabitants had been bent on making their city a veritable rainbow of colors. And the sheen was the most remarkable part of all. Each and every structure shone as brightly in its own particular color as if covered with the most glossy of baked enamels.

MANY of the smaller planes that had come out to meet them landed on the roof tops and one was seen to crash, in the excitement of its pilot, and go slithering down the sloping wall of a large building into the street below, where the pedestrians scattered in haste to escape the descending wreckage. Teddy maneuvered the Comet to a lower position and the passengers were relieved to see the occupants of the plane scramble from the wreckage apparently unharmed. And the occupants of the Comet were scarcely less excited than the inhabitants of this strange city seemed to be.

Their convoy of planes was now circling about the central portion of the city and the Comet was maneuvered to a point directly above them. The object of their circling at once became apparent, for directly beneath was a huge square, rimmed by a mass of humanity, but leaving in the center a large field providing landing area for the entire fleet. One by one the airplanes dropped to this space until all were safely landed, leaving a central opening for the landing of the Comet.

Teddy dropped the spherical vessel into place as gently as a feather and the voyagers rushed to the entrance manhole in their eagerness to reach the solid ground of Venus. With trembling fingers Teddy unbolted the circular cover, and he was the first to step forth into the brilliant Venerian sunshine. He blinked in the dazzling light and assisted the two girls to the velvety grass beneath the Comet. The rest of the party followed and the little group stood there beneath the curving bulk of their vessel dazed and expectant. There was a great hubbub about them, and, before they could realize it, they found themselves the center of a company of gaily caparisoned soldiery. There was a blast, as of the blowing of a thousand trumpets, and they were marched quickly through lanes of shouting and gesticulating Venerians toward a large purple building adjoining the field.

So confused were they by the din of their welcome that the first impressions of their surroundings were extremely indistinct, but the one thing that stood out most in their minds was the wealth of color in decorations and the great size of the people of Venus. Every one of their guards was at least seven feet in height, and from glimpses they obtained of the surrounding multitude, it appeared that all of their welcomers were built along the same heroic lines, male and female alike.

Amid the cheers and noisy clamor of the crowds they were hustled up a broad stair and through the massive gates of the purple building. It was not until the gates had closed behind them that they were able to calm themselves and take stock of their immediate surroundings.

CHAPTER X

Seritanis

THROUGH a long, brightly lighted passage they were led by their guards who, when they reached the magnificent portal at the end of the passage, dispersed, leaving only two of their number to escort the visitors within.

The sight that met their view when they stepped through the golden portal was one that again rendered them speechless and overcome with amazement. Before them spread a huge circular chamber, surrounded by pillars of gold and royal purple, and lighted with a soft but revealing light from hidden sources. The floor of this chamber was of highly polished metal of onyx-like beauty and the ceiling, far overhead, was dome-shaped and hung with purple and gold fabric of velvety texture. At the far side of the chamber rose an elaborate throne, whereon there sat none other than Queen Thalia, who had instigated their voyage. Hers was a queenly figure and the dignity and benignancy of her smile as she greeted them, endeared her to the visitors immediately. On either side the throne was flanked by twenty or more courtiers, all of giant size, and all with expectant eyes fixed on the newcomers. The huge room was as silent as a tomb as they neared the throne.

Thalia arose majestically and extended her hands slowly as she had in the telepathic visions. As if drawn by a magnet, Ralph stepped slowly from the group of his companions and approached her until he was so close he could have touched the hem of her golden robe. The queen looked down at him with a sweet smile of gratitude wreathing her beautiful pale features. She spoke.

Although the words issuing from the mouth of this queen of a giant race were in a strange tongue, the visitors understood every meaning as perfectly as if her

tongue had been familiar to them from childhood. Still they realized that it was not the words themselves they understood but the thoughts of the speaker. The words were merely a vehicle for obtaining the contact by which the thoughts from her mind were transmitted to theirs. And when Ralph replied to her greeting it was evident that she understood and that his meaning was clear to her courtiers as well. This was thought transference perfected, and Doctor DePolac became greatly excited, as he realized this.

"Friends from a distant world," she said, "I, Thalia, queen of all the islands of Coris, welcome you to our planet. And, in the name of my people, I thank you for your courage in coming to us and in offering your aid in our struggle for existence and for the perpetuation of our race. May the Great Power grant us success with your help. You are small of stature but great of mind. My mind tells me this, as I am able to follow the innermost thoughts of each and every one of you. And this power tells me that your thoughts are good and that your minds are possessed of much scientific knowledge unknown to the Corisians. You shall remain as my guests in the palace for as long a time as you are with us."

Ralph became spokesman for the group, since his mind was in more complete understanding than the others, on account of his previous experiences.

"We thank you for your kind welcome, your Majesty," he said as if to the manner born, "and we offer our humble services in any way in which they may be found useful."

The queen directed her gaze at him. "And you," she said, "are the recipient of my mental messages. Forgive me for causing you such mental distress in the initial experiments, but it was an extremely difficult undertaking and this suffering could not well be avoided. My own was as acute as was yours at first. To you I extend my deepest gratitude, since it was through your mental strength that I was able to reach your people."

"It was little enough I did, your Majesty," murmured Ralph.

"It was more than you know," responded the queen. "It was a superhuman feat on your part to withstand the process. And I am impelled to convey to you and to your companions the thought that to you I am not 'your Majesty,' but Thalia, in name. It is my wish that you address me in this manner. It is also my wish that the feminine members of your party approach more closely."

MARGARET and Mary neared the throne with admiring glances bent upon the stately figure before them. Never had they seen such beauty and grace nor so resplendent a costume. The queen, though of fully eighteen inches greater stature than Mary, impressed them as being one of their own sort, kind, human, and extremely beautiful. Her golden hair massed thickly about a perfect creamy white countenance, falling in fluffy waves from beneath the narrow gold circlet which was the insignia of majesty. Great brown eyes peered understandingly from beneath perfectly arched brows at these women from another world. The hands she extended to them were of ethereal whiteness and the long, tapering fingers were warm and friendly to the touch, when the girls impulsively grasped them, one on the left and the other on the right.

"My dears," spoke Thalia, "I am more than pleased to find you with this party and more than pleased to welcome you to my domain. You shall reside in my own suite and be cared for by my own attendants. The women of your world must be of rare courage to produce two such brave girls as you. I am afraid that none of my female subjects would dare make such a voyage as you have completed. I shall take you to your new quarters myself. Come."

She descended from the throne and, with hands still clasped by the girls, led them from the room, the courtiers standing with bowed heads as she passed.

When they had gone, the remainder of the party was surrounded by the nobles of the court who showered them with congratulations on their successful journey and with expressions of admiration for the genius of those who had made the trip possible. There was some difficulty in making themselves understood perfectly, since these Venerians did not seem to possess the telepathic power to so great a degree as did their queen. However, it was found that the contact became better as increased concentration was attempted by the visitors, and it was not long before their conversations became easier and more understandable.

The men were then conducted to luxurious suites in the palace which were to be for their occupancy for the duration of their stay on the planet. Thalia's chief adviser, Romos by name, attached himself to Ralph and Teddy, and led them to a beautiful suite with adjoining sleeping rooms overlooking the square.

As Ralph gazed at the teeming life of the great square and marveled at the colors of the flat-topped, sloping-sided buildings surrounding it, he suddenly recalled that no windows had been visible on the outside of any of the buildings.

"How is this?" he asked Romos, "here I am viewing the square through this large window and I see several other windows in the apartment, but none was visible from the outside of the building, nor are any to be seen in adjoining buildings."

"That is not a window through which you are observing the outside world," was the astounding reply.

"Not a window?" said Ralph, "what is it then?"

"It is an opaque panel or screen and the images on its outer side are transmitted electrically to its inner surface, being reproduced in detail exactly as if you were viewing them through an opening in the wall."

"Then there are no windows at all?" asked Ralph.

"None," said Romos. "All of our buildings are windowless."

"Then daylight never enters your homes or offices?"

"Never. Our scientists discovered many, many years ago that artificial lighting could be produced, which was not only more restful to the eyes than daylight, but at the same time more healthful to the body. The ultra-violet light in the sun's rays is much reduced in passing through our atmosphere and our artificial lighting contains a much greater proportion of these rays than does the sunlight. In fact it has been exactly proportioned to give the maximum of health-sustaining effect. In the several generations since this was accomplished our race has increased greatly in stature and in general health and physical vigor."

Teddy had been listening with extreme interest. "How about ventilation?" he asked.

"There, too," said Romos, "our scientists have improved on natural ventilation—that is, in so far as ventilation by means of openings in the walls is concerned. In the old days of windows, it was a common thing for our people to be troubled with colds and resulting complications of more serious nature. This was traced directly to the practice of ventilating buildings by means of open windows. The resulting drafts were the major cause of the trouble and much research work was done on artificial ventilation. The result was that windows disappeared and artificial ventilating came into universal use. Clean pure air is circulated through our buildings in such a manner that the carbon dioxide content can never exceed one part in ten thousand, and there are no drafts. This air is heated in the winter months and cooled in the summer, so that a uniform temperature is maintained the year around. The humidity is likewise maintained at a constant value. Our people no longer know what it is to develop a cold, and pneumonia and tuberculosis are

now things of the past. We have no open windows to let in the dust and germs from the streets, and other diseases are therefore greatly reduced as well."

Teddy whistled in astonishment. "Well, that is one score for your people, Romos," he said. "We can undoubtedly teach you some things about aviation and space traveling, but you certainly have gone us one better in this matter. I can't pick a flaw in the reasoning either."

Romos laughed again. "Yes," he said, "I am sure we shall be able to exchange some valuable knowledge. In fact we have learned much from Tinus already."

"Tinus?"

"That is what we call your world."

"But how could you have learned from us already. You have had no other visitors from Tinus, have you?

"No. But our astronomers have perfected optical instruments so powerful that we can observe Tinus very closely. As a matter of fact our airplanes are modeled after those in use on Tinus some thirty years ago. We have been unable to discover how you operate your present wingless craft."

Teddy stared in amazement. "Wait a minute," he said, "let me get this straight. I can understand the possibility of the very powerful telescopes, although it seems utterly improbable when thought of from the standpoints of our earth. But you say thirty years. At that time our planes were very crude and not at all like these powerful machines of yours, which resemble some of ours of less than twenty years past."

"I mean thirty Corisian years," smiled Romos. "You forget that your year is 365 days in length whereas ours is but 224."

"Yes, to be sure. I had forgotten," said Teddy in chagrin.

"Never mind," said Romos, "we all forget. But have you breakfasted?"

"No," said Teddy. And Ralph chimed in with the same reply. They were both hungry.

"Then that is the next thing to do," said their new friend, smiling down at them from his extra foot of height.

They followed him to the breakfast room, where they joined the other members of their party and partook of their first meal on the planet, known by its own inhabitants as Coris.

AN hour later they were turned over to a committee which had been appointed by the queen to entertain them in whatever way they desired, and to impart to them such knowledge of Coris and the Corisians as might be deemed necessary. Doctor DePolac and the professor elected to accompany two of the scientific members of the committee on an inspection trip through certain of the factories and laboratories. Captain French and Steve Gillette, who had become fast friends, chose an airplane trip to an outlying district which had been devastated by the traditional enemies of the Corisians.

Once more Ralph and Teddy found themselves with the two girls and separated from the rest of their party. They accepted with great pleasure the suggestion from Romos that a trip be made through the city, to make the acquaintance of the inhabitants, their occupations and their mode of living.

"Seritanis," explained Romos, when they were on their way to the street, "is the name of this, our capital city. It is situated on Thronia, the largest island of the planet, and has a population of upwards of seven millions of people. The island itself is about two and a half million square miles in area and supports a population of more than sixty millions."

The figures used in Romos' language were entirely unintelligible to the listeners, but through the marvel of the Corisian thought transference, were easily translatable into figures with which they were all acquainted. It was becoming increasingly easy to converse with and to understand their hosts.

"Then Professor Timken was correct in his assumption that Venus, or Coris as you call it, is for the most part covered by water?" asked Teddy.

"Yes," replied Romos. "It is ninety-two percent water on the surface, the total area of land, about fourteen million square miles, being made up of three thousand, two hundred islands of varying sizes. All of these are inhabited to a greater or less density with the exception of the sixteen which have been devastated by the Kellonians. The total population of the globe is now about four hundred and fifty millions, though at one time we numbered more than twenty times that many. The population was of course extremely dense, more than seven hundred inhabitants to the square mile, but the resources of the planet were sufficient to support them all and, were it not for the warring of the Kellonians, we should now be as great in number. You see, our total area of land had just about reached the limit of its possibilities in the way of supporting life, and we had to resort to birth control to limit the population to the then existing density. But the Kellonians came and the problem was forgotten. Thousands of once great cities are now deserted and crumbled in decay."

Romos hesitated—closed his mouth abruptly, and turned his head to hide his feelings.

"These Kellonians," said Teddy, after a moment's silence, "what are they like and whence do they come?"

"Let us forget about them for a while," replied their new friend with an involuntary shudder. "You are to hear more about them later. For the present we are to enjoy ourselves, and to do some visiting about the city."

THEY had emerged from the square and were now in a street, one of the main arteries of the city, judging from its appearance. Romos led them from the first moving way, which operated at moderate speed, across several others running at gradually increasing velocities until they reached the inner way, which sped along silently and smoothly at about twenty-five miles an hour. In the central space between the two systems of moving platforms, one northbound and the other southbound, was a broad, green-surfaced roadway along which vehicles of every description sped in both directions. The visitors were surprised to observe that this green roadway was of some metal resembling the green gold in use on earth for articles of jewelry and that the vehicles were all of the two-wheeled variety, evidently balanced by some gyroscopic or other means within their bodies. There were four lines of traffic in each direction, the highest speed being attained by the vehicles in the center of the roadway. Teddy judged the maximum rate to be somewhere in the neighborhood of ninety miles an hour and Romos advised him that he was correct in his judgment.

The girls looked eagerly for shop windows but in vain. When they questioned Romos regarding this lack he smiled and told them that all shopping for necessities and luxuries was done in great central emporiums where exhibits and demonstrations were in constant progress. Upon their eager insistence that one of these establishments be visited, Romos apologized and explained that all shopping was done by the other sex, and that he had never visited a shopping center himself, and would thus be a very poor guide. He suggested that they make a shopping tour with one of the ladies of the court and with this they had to be satisfied.

They soon stepped from the moving way, or Torat, as it was designated by Romos, and entered a gleaming scarlet building of large size, into the entrance of which an endless stream of Corisians was pouring. The visitors

were hailed in a friendly and almost reverential manner by all of the inhabitants they encountered and a way was made for them through the crowd when they traversed the corridor and approached the entrance to a lift. Their guide spoke a word to the operator of the elevator, and they were immediately shooting skyward with a smooth rapidity that was in every way reminiscent of the high speed elevators of their own earth.

When they left the elevator, they entered a large room buzzing with activity. Hundreds of Corisians sat at long tables which extended the length of the room in parallel lines. Each worker, all of them women, was separated from her neighbor by a small vertical partition extending some three feet above the table top. A small booth was thus formed before the individual worker, and Romos led the visitors to the nearest of these to show them the manner of work engaged in. The operative, a handsome woman of middle age and somewhat smaller than the general run of Corisian women, smiled up at them when they paused at her booth and then turned immediately to view a circular panel she had been facing. Her fingers rested on a complex arrangement of buttons similar to the keys of a typewriter. These she manipulated rapidly as she gazed at the disc before her. On the disc itself there appeared shifting shadows of wavy form which curled and twisted swiftly with the convolutions of smoke rings and billows shifted by an errant breeze. It was an extremely mystifying procedure to the visitors. Teddy turned inquiringly to their guide.

"THIS," explained Romos, "is the Tritu Leboru, or General Intelligence Bureau. These workers, especially educated and trained for the work from childhood, are receiving news from all over the planet. The shifting figures on the discs are thoughts transmitted from afar and the operator records these thoughts by means of the manipulation of the keyboard, which impresses them in their proper sequence on a continuously rotating circular record, which is on an automatic machine located in an adjoining room. The records are then duplicated and distributed to the public intelligence centers and to the homes of our people, to keep them advised as to the happenings of the day. Each individual subscribing to the service is supplied with a machine upon which his daily recording is placed, when by a simple connection to a disc similar to the one before the operator, the recorded thoughts are conveyed to the subscriber and to all members of his household."

"But these wavy lines and shifting figures on the disc," objected Ralph, "can these be read by sight by all of your people?"

"It is not a question of reading them," answered Romos, "but rather of concentration of the sight on the disc as a whole. The shifting images on the disc, when impressed on the retina of the eye, are transmitted to a certain portion of the brain and there rectified as actual thoughts. What transpires on the disc in a few minutes of time would actually require nearly an hour to communicate by means of the spoken word."

"How are these thoughts transmitted from the far corners of your world?" asked Teddy. "By radio?"

"Radio?" said Romos. "I do not know what that is. But the thoughts are transmitted over beams of etheric vibrations of a nature similar to those we used in communicating with your earth."

"That is similar to what we call radio on our own earth with the exception that we transmit spoken words and pictures by radio," said Teddy. "But one thing I cannot understand is why your people use the spoken word at all when you are so adept at communicating by means of actual thought transference."

"We can only do that mechanically," said Romos. "I am unable to explain it to you fully, but the spoken word is the mechanical means of obtaining mental contact when addressing each other directly. Of course, in conversing with you people from Tinus, we use many times the number of words we would use in conversing with our own kind, since contact is not so readily made. When at a distance, communication can be had directly between the communicants without the use of words, since the mechanism of the apparatus used provides the contact. Some few of our people are so adept in the art of thought transference, that they are able to communicate without the spoken word by merely placing their fingers in contact. They are thus able to communicate in secret and without disturbing others, but their number is exceedingly small."

"Doctor DePolac should see this," laughed Ralph. "It makes his electro-telepathoscope seem crude by comparison."

"Oh, I don't think so," said Margaret loyally. "You must remember that the doctor is dealing with minds not versed in the mysteries of telepathy, and that his machine does much mechanically that the Corisians are able to do with their own minds. But it is all very wonderful here."

"Indeed it is," said Mary, "and I am anxious to see more."

Romos took them from floor to floor of the building and showed them the intricate machinery of the great establishment that provided the people of Seritanis and the surrounding territory with their daily news. Teddy was greatly astonished by some of the details of the apparatus used, and he soon made an astounding discovery. The parts of the various mechanisms were mostly constructed of gold and platinum. There seemed to be no evidence of the use of copper, lead, or iron. He commented on this to Romos and was advised that whereas gold and platinum were plentiful, there was a great scarcity of the metals most common on earth. This was particularly true of lead, their rarest metal, which was used as a medium of exchange by the Corisians. He displayed a roll of lead foil of extreme thinness which he told them was currency. They learned later that these rolls of foil were used in much the same way as was paper money on earth with the exception that the sections of foil with which commodities were purchased were carefully weighed on delicate scales and the proper amount cut from the roll for each individual purchase.

After leaving the Tritu Leboru, the visitors, with their minds still busy absorbing the strange things they had seen and learned, were told by Romos that it was nearly time for the midday meal. They were greatly surprised at this as they had not realized that almost the entire morning had been spent in the inspection of the one establishment. But it had been a pleasant and instructive visit and served to prepare them for the still more remarkable sights they were to see later.

When they again assembled in the dining room, which had been set aside for them in the palace, they found that Steve Gillette and the captain were missing from the group. But the doctor and the professor had arrived earlier and were engaged in an excited discussion of the wonders they had themselves seen in the factories they had visited.

Mary's notebook was nearly filled.

CHAPTER XI

Concerning the Kellonians

LATER in the day Ralph found his first opportunity of seeing Margaret alone since they had arrived in Seritanis. Teddy and Mary had discovered a neighboring theatre and had taken it into their heads to run off by themselves to see what a Corisian drama was like. Margaret was a little hurt at the defection of

her friend, but Ralph was jubilant and it was not long before he had inveigled her into visiting the conservatory which Romos had advised him was located on the upper floor of the palace. Romos was obliged to attend a meeting of the Adron, the queen's council, that afternoon, so they were left entirely to themselves.

"I am worried about Captain French and Steve," said the girl soon after they entered the conservatory, where flowers and plants of exotic and unfamiliar beauty grew in colorful profusion.

Ralph was not so pleased at this. "Oh, they are all right," he said carelessly. "But why are you so concerned about the captain?"

Margaret looked at him keenly. "Ralph," she accused him, "you are jealous. I am worried about both of the boys as they have been away since early morning and no one has heard a word from them."

"That is true," agreed Ralph, "and they started for a visit to one of the devasted areas. I hope none of the Kellonians remained and attacked them."

"Now you are yourself again, Ralph. That is just what has been going through my mind. But let's hope for the best."

"That's all we can do. But I guess there has been no trouble, because we should certainly have heard of it through this system of news reporting of the Corisians."

Margaret had bent over to examine a broad-petaled blue flower which grew close to the ground on a trailing vine-like plant.

"Oh, Ralph," she said, "look at this. Isn't it beautiful?"

He knelt to examine the flower with her. It was indeed beautiful. It was a flower similar to a pansy but of fully six inches diameter. And the face on its velvety surface was even more human in appearance than the pansies with which they were familiar. As the girl bent her head still closer the fragrance of her hair assailed his nostrils. Impetuously he seized the hand she had thrust beneath the flower to raise its face toward her own. They both stood erect at once, forgetting the beauty of the flower, and Ralph looked down eagerly into Margaret's upturned and suddenly rosy face.

"Margaret," he breathed, "I love you."

"I'm glad, Ralph," she said, "I expected you to say so sooner, but you are rather old-fashioned and backward—and—and jealous. I love you, too."

It was as simple as that. And Ralph proved anew that he was old-fashioned, for there was nothing matter-of-fact or blasé about the manner in which he swept her from her feet in a great embrace and kissed her.

When he released her, she straightened her hair and laughed a little nervously. "You *are* a cave man, aren't you, dear?" she said. "I guess I'm a little bit old-fashioned myself."

There were voices at the far end of the conservatory and someone called out, "Prescott!"

"Here," answered Ralph, reluctantly taking his eyes from the face of the beautiful girl, who had just admitted her love for him.

Steve Gillette and the captain advanced down one of the aisles and greeted them excitedly.

"They told us below that you were up here," said Steve, "and we want you to come down. The captain and I have just returned from Botan, one of the islands visited by the Kellonians, and we have a lot to tell you. The doctor and Professor Timken are there, too, with a couple of high-brow scientists with long gray beards, and they want to talk things over. Where's Crowley?"

Ralph smiled at his impetuosity. "He and Miss Holmes went to one of the theatres," he replied, "but they should be back almost any time now."

"I hope so," said Steve shortly. "But come on. Let's go."

"You lead the way. We'll follow," said Ralph.

Steve started for the elevator and when Captain French looked back he saw that Margaret was hugging Ralph's arm and smiling up at him in an obviously affectionate manner. The captain sighed in disappointment. Petite, vivacious Margaret had appealed to him greatly and he was beginning to think seriously of his own feelings toward her. It was now apparent that he was too late.

A FEW minutes later the four entered the professor's sitting room, where they found him in earnest conversation with Doctor DePolac and the two elderly men who had been so graphically described by Steve. The latter were presented as Castrini and Lorver, two of the greatest scientists of the Royal Academy of Coris. They were considerably smaller in stature than most of their race, being only two or three inches taller than Ralph, who was the tallest of the visitors. They were soon joined by Teddy and Mary, who returned from the theatre with many new ideas of the life of the Corisians, ideas obtained from the vivid portrayals in the drama they had witnessed.

"Now that we are all together," said the professor, "I should like to discuss this matter of the Kellonians. Steve and the captain saw some of their work in Botan and are thoroughly aroused over what they witnessed. We are here to see if there is any way in which we can assist our friends in ridding the planet of the menace of their enemies. And I think it is time we commenced doing some serious thinking on the subject."

"You are absolutely right, Professor," said Teddy guiltily. "Let us hear about it now."

"I have learned much from Castrini and Lorver and have heard some of the things seen by the captain and Steve," said the professor, "but I think it would be well if we go over it all again. I shall ask Castrini to enlighten you."

The aged scientist bowed. "Friends from Tinus," he said, "I have already conversed at length with Professor Timken and with Doctor DePolac and find them to be great scientists. There are, however, many things yet to be said, so, with your permission, I shall tell you of our enemies, the Kellonians. As I proceed, please do not hesitate to ask any questions or to interrupt me at any time you see fit."

He spoke slowly and with dignity as if endeavoring to convey his thoughts as completely as possible.

"About two centuries ago, which is to say a little more than a hundred and twenty years of your time, a great tapering cylindrical metallic object was reported to have fallen on the island of Rili, some half way around Coris from Thronia and almost exactly on the equator. Rili, while much smaller in size than Thronia, was one of the most important islands of our globe from an industrial standpoint. Being densely populated at that time, thousands of inhabitants reached, in a very short space of time, the spot where the strange object had fallen. When they examined the metallic walls of the cylinder, crowding about it closely, there was a sudden burst of blue flame from within their midst and more than two thousand of our peaceful people were destroyed by the single blast. The rest of the multitude fell back in alarm, but to no avail. At once a sort of tower-like structure was projected from the deck of the cylinder and a brilliant orange light surrounded the top of the tower like a flaming beacon. All who were within a radius of nearly a mile were stricken powerless, helplessly paralyzed. Thousands fell to the ground speechless and with glazed, sightless eyes fixed in unnamable terror. No wars nor strife of any sort had marred the serenity of our progress for several centuries and now, absolutely unheralded and unexpected, there appeared a great and horrifying danger. Those who escaped the paralyzing power of the beacon halted in their tracks and then beat

a precipitate retreat to a safe distance, to watch the terror that was emptying from openings in the side of the metal cylinder.

"These openings—long black slits they were that gaped horizontally—spewed forth a jelly-like mass of bestiality. Long, slimy tentacles reached forth, wriggling slowly and evidently with great effort. Then, huge bulbous black bodies, headless but with saucer-like, staring eyes, flopped to the ground like great wet cloths with squashing sounds that sent shudders through the Corisians who watched. These monsters moved slowly, laboriously, but with inexorable precision. They made their way across the waste where the blue fire had cleared a space around their vessel, the blackened, blasted waste where the two thousand had perished. There were no charred remains of bodies or vegetation—nothing remained save a blackness of destruction, the like of which had never been seen on the face of our globe.

"DOZENS of these ponderous creatures dragged themselves steadily toward the thousands of helpless, living victims, while the unharmed survivors gazed speechless, unable to help. What was to be the fate of the living, who could not escape or even move a muscle to defend themselves, they did not know, but they were certain it would be horrible and most of them retreated ever further in their terror. When the first ranks of the invaders reached the paralyzed living, a groan of anguish arose from those still on their feet. Writhing tentacles, with inner surfaces covered with suction cups, reached forth and encompassed the helpless living bodies in bundles like so much firewood. Each of the invaders was able to drag back to his vessel at least a dozen Corisians and it was not long before they had dumped fully a thousand victims through the slits in its side. Again and again they returned and finally it seemed that the compartments of their vessel must be filled. Then a still more horrible thing was witnessed by the survivors. One of the invaders lifted a helpless Corisian high in the air with two of its tentacles, and as it did so, a cavernous mouth beneath the fixed, staring eyes opened and the tentacles descended in coils, stuffing the body into the horrible opening with one last triumphant, revolting gesture."

"My God!" shouted Steve. "And nobody did anything?"

"What could they do?" asked Castrini sadly. "They were powerless against these monsters. But when they saw with certainty the fate that was to befall their erstwhile companions and relatives, they rent the air with shrieks and ran for their homes in a frenzy of disgust and demoralization. That was the beginning."

"Then the wasted and blackened areas we saw at Botan and on the islands we passed over on our way here were caused by this blue flame generated by the Kellonians?" asked the captain.

"Yes."

Ralph was stroking Margaret's hair tenderly. She had bowed her head and shuddered at the recital. Mary was busy with her third notebook but her face was tensely white.

Teddy glared indignantly. "And has the same procedure been followed on every raid made during all these years?" he asked.

"Essentially," Castrini responded. "Sometimes the raids are not as extensive, sometimes they are even more so. And now they come in three of the galdons, as we have termed the space ships, instead of in one."

"Where in Heaven's name," blurted the doctor, "do they come from?"

Castrini shrugged his shoulders. "We know not," he said, "except they come from the sky—evidently from some celestial body much smaller than Coris, for their movements indicate that our gravity is very much greater than that of their own abode."

"But have you made no efforts to fight them off?" asked the captain incredulously.

"Indeed we have," said Castrini. "At first our people were so utterly unprepared as to be completely at their mercy. We had no weapons of any sort—none had been needed since savage days which were left behind in the dim past. After the second raid the frenzied populace took to deserting the cities and spreading out over the countryside. They nearly returned to savagery for a period of many years. They fashioned crude weapons, spears, bows and arrows, and burrowed into the ground in caves to get away from the terrible menace. It was a hopeless period—The Cowardly Age, we call it. Then the superior intellect of our people reasserted itself and rehabilitation began. Our scientists worked and experimented until they perfected weapons which were partly effective against the enemy. But, when we first used our new weapons against them, we met with terrible reprisals.

"During one raid we were fortunate enough to destroy thirty or more Kellonians, but the remainder of the raiding party made their way back to their vessel. A period of terror followed, which so cowed our people that they did not attempt to repulse the enemy for over a year. This was on the island of Jare, which was then inhabited by about eight million people."

Castrini hesitated.

"And then?" asked Margaret gently.

"They destroyed every single one of those eight million souls and the island as well."

Ralph whistled. "How?" he asked.

"With their blue flame. They merely sailed their ship around the island and the blue flame poured forth continuously, utterly consuming everything it touched. The flame goes even further than that; it leaves a spreading destructive force wherever it touches. Pits of smouldering brimstone seem to grow and spread, sometimes flaming up into huge flares that spread for several miles in one burst."

"So that is what we saw on one of the islands we passed over?" asked Teddy. "But continue, Castrini."

"DURING the next raid our people feared to attack and the enemy carried away only a thousand of our number, leaving at once without causing further damage. Coris became resigned to its fate. For many years there were no attempts at reprisal. A truce seemed to have been made and it was a generally accepted fact that the enemy would visit us twice in each year and exact as tribute the paralyzed bodies of about a thousand of our people. This tribute has been given to ward off wholesale destruction such as that which occurred at Jare. Evidently our enemies, whom we have named Kellonians for lack of a better name, want only about that number of people for gastronomic delicacies or to use as slaves.

"But, after a number of years of hopeless submission, our scientists again discovered new weapons they believed to be effective in destroying the space ship itself. But they reckoned without the enemy, for on the next raid we were visited by two vessels. One was destroyed spectacularly by a heat-producing ray of our own. The other escaped and destroyed two of our most prosperous and thickly populated islands. Another period of submission to the semi-annual tribute followed, but our people became inured to the steady drain and gradually appeared to lose the previous great fear of the enemy. We became a race of stoics, expecting disaster and no longer shrinking from it. These cycles have passed several times and now sixteen of our islands have been destroyed completely. The population has dwindled to one-twentieth of its former number and we fear it will soon be lost to this great universe of ours entirely."

The professor interrupted. "How is it that with your powerful telescopes you have not been able to discover the body from which the Kellonians come?" he asked.

"That is the greatest mystery of all. Our astronomers have minutely examined the surface of every planet and satellite in the solar system and have been unable to locate their abode. And it hardly seems possible they could reach us from some other system so remote as to be incapable of close examination by our optical instruments. It would be physically impossible to reach us and make two return trips each year, even at the speed of light."

"Have you tried explosives on them?" asked the captain eagerly.

"Yes," said Castrini. "Our last defensive attack was by means of guns patterned after those we observed in use on Tinus nearly fifty of our years ago. Again we wrought great damage but again there was a severe reprisal. We have apparently not been able to develop explosives to even a fraction of the power of those in use on your earth. Why, I do not know, for our scientists have worked on the problem ever since that great war of yours. And, oh, friends from Tinus, that war caused us great sadness. We had contemplated calling upon you for assistance, but that war brought despair to our hearts and delayed our message for many years. We feared we might be involved in a disaster just as great. But of late years we have observed with joy that your peoples have lost their warlike tendencies to a great degree. We have watched you building big guns and big fleets of war vessels, but have come to the conclusion that they are to prevent rather than to cause wars."

The captain smiled appreciatively. And, triumphantly, he thought of the stores of the new deadly explosive on board the Comet.

"Have you tried defensive armor?" he next asked.

"We have. No metal seems to be proof against the paralyzing rays from the orange fire. And the blue flame utterly consumes any metal we have been able to produce."

"Possibly the scarcity of iron and lead and other metals has had something to do with this," suggested the professor.

"Quite possibly," Castrini admitted. "We have had to use mostly alloys of gold, platinum, zinc, and the like. Do you believe that our rarer metals might be more effective?"

"All of our armament against explosives is of some form of steel, which is made from iron combined with other substances such as carbon, nickel, cobalt, and chromium," the professor replied. "But against etheric vibrations and cathode rays and the like we use combinations of lead."

CASTRINI gasped. "Why," he said, "those metals are very rare, indeed. We could not get together enough lead in the entire globe to construct one protective building or to armor a war plane. And iron is nearly as bad. We must work with the metals available to us."

"Of course," the professor agreed. "And that has undoubtedly put you at a considerable disadvantage."

Teddy and Captain French exchanged meaning glances.

"We may be able to help you with certain stores from our vessel, the Comet," he said.

"That is what we hope," said Castrini simply. "Or if not by means of any stores you might have, at least by means of your superior knowledge of warfare in general."

"What is the general feeling of the people at the present time?" asked Ralph. "They appear happy enough on the streets."

"They do make merry," said Castrini, "but it is the merriment of the doomed man who knows no escape and bravely and defiantly faces the end. But mothers refuse to give birth to children to face this great danger. Therefore our race is dying off much faster than as if the mortality were caused by the enemy alone. You probably have noticed the extremely small numbers of young people among us?"

"I have," said Margaret thoughtfully, "and the reason had not occurred to me. Practically all of those on the streets today were people of middle age or past. I saw only four or five whom I should have imagined as being younger than myself."

"That is the situation in a nutshell, young lady," said the aged scientist, giving her a kind smile.

Mary's pencil raced madly and she looked up startled as the door burst open suddenly and Romos entered the room in great haste. His handsome face was flushed and angry.

"What is wrong, my dear Romos?" asked Castrini.

"The fiends are here again," he announced tragically.

Excited exclamations came from the group and they all jumped to their feet and crowded around the messenger.

"Where?" asked Lorver.

"Reports have it that they have landed two of their ships on the island of Prastia," he growled, "and this is the third attack this year—the second in twenty days."

The three Corisians, Romos and the two elderly scientists, looked helplessly and beseechingly into the faces of their visitors.

Ralph bellowed in anger and Margaret looked at him with something of pride, something of fear in her eyes.

"We'll go out and get them in the Comet," he shouted. "Are you with me—Teddy—Professor—everybody?"

"You bet!" said Teddy.

"Absolutely," came from the professor.

"Let's go," yelled Steve.

Ralph turned to Margaret. "You and Mary will remain here safely in your quarters," he said.

Margaret flushed and opened her mouth as if to speak, then closed it again and stamped her little foot. "Why, Ralph Prescott," she finally sputtered. "Don't you dare talk to me that way! We shall go—we shall!"

"Now, now, dear," said Ralph soothingly.

"Well, I'm going," said Mary decisively, snapping shut her notebook and placing it with her pencil in the bag she carried for that purpose. "No one's going to stop me, either," she concluded defiantly, staring at Teddy.

Ralph and Teddy stared helplessly at each other, then grinned.

"All right," they agreed in a single voice.

"Come on," said Steve impatiently. "Quit mooning, you four. Let's go."

The tension was relieved by the laugh that followed and they all trailed after Steve as he strode to the door.

Romos hurried to get a pilot and to pass the word to the Tritu Leboru so that all might know that the visitors from Tinus were on their way to see what might be done.

It was an excited group that entered the Comet a few moments later, the crew including the two Corisian scientists as well as Romos and Valdor, a youngish Corisian, whom he introduced to Teddy as an experienced navigator.

A crowd had gathered in the square around the Comet and they cheered and shouted as the adventurers embarked. With the navigator at his side Teddy grasped the controls and swung the Comet gracefully from the mass of crowding humanity about it.

Again the Comet was off!

CHAPTER XII

The Raid

"WHICH way?" asked Teddy gaily as the Comet gained speed in ascent.

Valdor gazed about him at the complicated and unfamiliar controls and instruments. Finally his eyes

lighted on the magnetic compass and his face brightened at once.

"Two points east by northeast," he said excitedly.

"Right-o!" Teddy sang out and the Comet swung around on that course, still rising with rapid acceleration.

Valdor gasped but said nothing when, on his asking for a translation of the altimeter reading, Teddy advised him they were up one hundred thousand feet. He gasped again when, a little later, he was told their speed was nearly a mile a second.

"How far is it?" asked Teddy.

"Four thousand miles," he replied. Then he smiled. "I feared we should be too late," he continued, "but at this rate we shall be there in an hour."

"Even less," said Teddy. "We are still accelerating and I shall not decelerate until half the distance is covered. We should do it in little more than a half hour."

Valdor and Romos exchanged wondering glances. Captain French had disappeared into the upper portion of the vessel with Ralph and Steve, who were impatient to get to the arms and ammunition.

The navigator mastered the workings of the various instruments in a very few minutes and gave instructions from time to time, when there was need of changing the course. The Corisian scientists examined all the mechanisms of the control room with unconcealed interest.

The girls peered excitedly through the lower windows at the inky ocean dimly visible through the atmospheric haze. The sun was nearing the up-curved horizon and the flaring colors that marked its trail occasionally lit up the haze below with vivid streamers of flashing beauty.

Doctor DePolac and the professor were in the smoking room, engaged in earnest conversation.

"These people are cowards," snorted the professor. "They are clever enough in science as far as they go—ahead of us in many ways, but far behind in others. And they have no more stamina and courage than rabbits."

"I'm not so sure, Professor," said the doctor slowly. "Environment, you know. I'm inclined to think the exact opposite. It seems to me they are extremely courageous. Facing certain disaster at some time or another, they are cheerful and brave. And, by your own statement they have been handicapped in their scientific work by the lack of sufficient materials of certain kinds quite necessary for their greatest needs in this matter. No, I do not agree with you."

However, the professor was still a little contemptuous. "But this tale of an undiscoverable planet is ridiculous. If they have instruments as powerful as they seem to have, I don't see how they could miss it," he said.

"Well, Professor, I don't know so much about your line, but I have a feeling that none of us should crow too soon. We may be no more successful than they were and we may all lose our lives on this mad venture."

"That is true," agreed the professor, gravely now, "and maybe I was a little hasty in my judgment. I wish these girls had not come with us."

"So do I."

The rising whine of the machinery had reached constant pitch. Now it descended as smoothly and slowly as it had risen. "We must have passed the half-way point," said the professor, "and it will not be many minutes until we get our first look at the Kellonians. Suppose we return to the control room to be on hand when our destination is reached."

"All right," agreed the doctor, "but I wish this thing was over."

"So do I, Doc. For all my criticism of the Corisians I must confess I am a bit apprehensive. The inner lining of the Comet is, I feel certain, proof against any emanations such as those used to paralyze living beings. But this blue flame of the Kellonians is another thing. I am not so certain that the hull of our vessel is capable of resisting its destructive effect. From what we have seen and from what Steve and the captain reported from Botan, this fire, whatever its nature, will fuse even platinum. This being the case, the super-silicon steel hull of our ship cannot be expected to protect us. Of course, we have the advantage of great speed with which to escape the danger. On the other hand the enemy vessels are capable of traveling as fast as we. However, we are in for it and we shall do what we can."

They repaired to the control room where the rest of the party had already gathered. Captain French was distributing among the group the cathode ray projectors he had provided as part of the armament of the Comet. These were metal tubes of about two inches diameter and some eighteen inches in length. At the base of each tube was attached an egg-shaped vessel of some four inches length which contained the ray-generating apparatus. To each of the party he explained the operation of the weapon, whereupon he and Ralph returned to the upper compartments for further equipment.

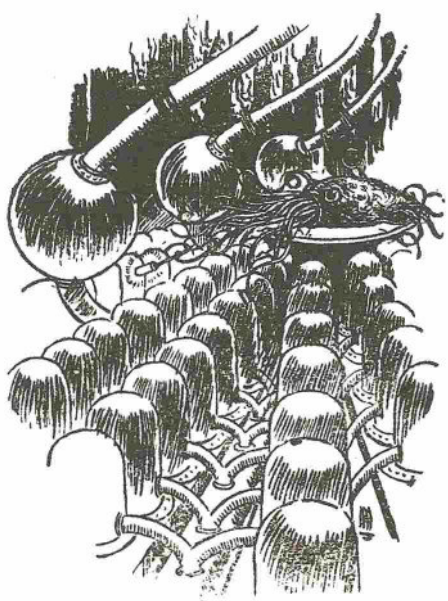
BY now the island of Prastia could be made out ahead of them, shrouded in the green haze of the twilight. It was of considerable size, and mountainous. Castrini informed them that it was of one-fourth the area of Thronia and inhabited by eleven million Corisians. As they approached more closely they sighted a large city and several smaller towns on the island, these being built in valleys between the purple mountains. Soon they were some distance inland and the Comet descended cautiously from its altitude of about twenty miles.

"Look!" exclaimed Margaret in great excitement, "there is one of their vessels."

She pointed to the spot where her keen eyes had discerned one of the torpedo-shaped ships of the Kellonians. It was poised over a mountain top, partly obscured by the haze, and not far from the principal city of the island. Teddy maneuvered the controls and the Comet moved in the direction of the raider. As yet there was no evidence of any damage having been wrought, but as the Comet approached more closely, the shapes of a swarm of airplanes could be made out. These had set out from the city and were nearing the galdon with the evident intention of attacking.

Lorver groaned. "That is the city of Palun," he said. "My nephew lives there with his wonderful family—a beautiful and courageous mate, who defied fate in bringing two fine children into existence. May the Great Power protect them!"

The Comet approached to within ten thousand feet of



There were rows of oxygen generators.

the galdon just as the swarm of defending airplanes reached the spot. The airplanes circled madly about the long body of the Kellonian vessel, which showed no sign of retreating nor of attacking. The leader of the attacking fleet emitted a cloud of black smoke as a signal and immediately, from every plane (fully thirty of them) there burst spurts of flame in rapid succession.

"Machine guns!" exclaimed the captain, who had returned silently. "What can they expect to do with them?"

But the machine gun fire had instantaneous effect. A port on the upper side of the raiding ship opened suddenly and from it there rose the tower-like structure described by Castrini. At its appearance, the three Corisians exclaimed hopelessly. But the attackers were alert and sped away to a safe distance.

Teddy dropped the Comet still lower and the passengers were soon able to make out the huge bulbous, combined body and head of one of the enemies. This monstrosity was holding to the tower with tentacles entwined through the latticed structure. The orange flame had not appeared, when suddenly one of the attacking planes made a swooping dive almost directly at the tower, its machine guns spitting fire at the exposed enemy. The aim was good, as the horrid tentacles slowly unwrapped their hold and the great body of the Kellonian slumped to the upper surface of the craft and slid slowly over the side, falling to the ground far below in a flopping grotesque heap. A cheer came from the occupants of the Comet and the captain shouted his glee.

"Not so bad at that," he exulted. "These Corisians are game fighters and have some ideas of their own. I'll apologize for my remarks."

But his enthusiasm was short-lived, for a second Kellonian appeared and, as ten of the attacking planes approached, the orange tuft of flame appeared from the tip of the tower. The ten planes went down out of control, their pilots paralyzed in their seats.

"Damn!" exclaimed Ralph. "Why don't we do something?"

The captain was on his knees at one of the ports which he had already opened. In his hand he held a small object the size of a baseball.

"Let's see what this'll do," he said, hurling the object from the opening.

For a space there was no sign except the rapid retreat of the surviving planes, whose driving motors could be heard through the open port in the Comet. Then there came a terrific detonation far below, an explosion that rocked the Comet like a ball floating on the ocean. The galdon was hurled toward the west with the speed of a rocket and a gaping hole appeared in the mountain side beneath its quitted position. Boulders and great masses of uprooted earth scattered over the surrounding countryside.

"I missed!" shouted the captain, in disgust, "but maybe she's disabled anyway."

THEY turned startled eyes toward the position of the galdon and saw that the vessel was indeed damaged. A considerable portion of the blunt prow had been caved in like paper and the ship reeled and staggered in close proximity to the ground. But, with a quick lurch, it rose and headed directly for the Comet. It was still able to maneuver, though apparently difficult to control, and those in the control room of the Comet realized that they were in for a pitched battle with the enemy.

As the raider came on, the orange flame appeared once more and then, vivid blue flame roared out from its under side, sweeping the ground beneath with its awful searing destructiveness. They were several miles from the city limits, but a number of small villages and farms were destroyed before Teddy realized what the enemy was up to. On came the raider, gaining altitude slowly as if partly crippled. Then, with another lurch, it rose ever faster, until it had reached the altitude of the Comet. Still it rose, and those in the control room shuddered as they saw its intention was to rise above them and annihilate them with the horrible blue fire. But Teddy was too quick for the invaders and the Comet ascended with terrific velocity as he jerked the control levers with frenzied speed. Their speed was too much for the raider and they were soon far out of reach. But the flaming ship beneath them, seeing that the maneuver had been outwitted by this strange new antagonist, headed for Palun with the obvious intention of revenging its defeat.

The blue fire literally dripped from the menacing shape, leaving huge smouldering craters wherever it touched the ground. Darkness had now set in, but the eerie light of the sulphurous flames lit the countryside for miles around while the pools of spreading blue destruction and occasional bursts of their increasing activity marked the trail of the vicious galdon. Death and destruction again spread over the land and was threatening Palun.

Mary's pencil was idle, forgotten. She stared fascinatedly at the terrible scene below. "Can't something be done?" she asked in agony of spirit. "Oh, Teddy. Can't we do something?"

"How about it, Cap?" he called to Captain French, without taking his eyes from the instruments before him.

But the captain had vanished and the two girls wrung their hands in misery as it seemed that nothing could be done to save the great city they were so rapidly nearing.

"Ralph, Ralph!" said Mary, turning to where he had crouched but a moment before. But Ralph, too, had vanished.

Valdor cursed in untranslatable terms, while Castrini and Lorver shook their imposing gray heads in disappointment. But there was a commotion at the door and Ralph and the captain entered, struggling with the weight of a mechanical contrivance which they set on the floor of the control room over one of the circular ports.

"Fool that I was," grunted the captain savagely, "not to have anticipated this. This energy projector should have been set up before we even started."

Rapidly he made some adjustments, then started up the stairs trailing three heavy flexible cables which connected with the complicated machine on the floor.

"He's connecting these to the main generators," explained Ralph. "We'll have some high power for them in a minute. And, Ted," he continued, "maneuver us directly over these monsters. The captain doesn't dare use his high explosive for fear of causing as much damage to our friends as to the enemy."

They were nearing the outskirts of the city when the captain burst into the room and rushed for the curious mechanism he had set up. "All's ready," he said.

The Comet was a mile above the galdon, which was sweeping the ground with its blue terror. The city limits had been reached and they watched the spreading blue flames on the ground as they lapped against the first of the buildings and spread along a green-paved street where the moving ways shriveled and melted at their touch.

From the machine at which knelt Ralph and the captain, with Steve dancing about them expectantly, there arose a shrill sound reminiscent of a factory whistle.

"Now," said the captain, rapidly manipulating several shiny metal wheels. "We'll give them the works."

NO visible ray projected from this machine but suddenly the orange beacon of the raider's tower commenced to dim. The drifting engine of destruction below tottered and halted. Along its upper surface spread a glowing spot, that soon reached dazzling whiteness and covered the entire vessel. Streams of white-hot sparks sprang from its sides, like those produced by the acetylene welder working on steel. Then it fell into

the city, a great molten mass with the flaming whiteness of its consumed metals mingling with the blue horror of its own making.

"Sorry we had to add a little to the destruction of the city," apologized the captain, rising and mopping the sweat from his brow, "but at least we prevented their further progress."

The girls were frankly sobbing. Steve hugged the two Corisian scientists to his breast in his glee.

Suddenly the professor shouted, "We are falling!"

It was true. The Comet seemed to be out of control and was rapidly descending! Teddy pulled frantically at his control levers but to no avail. The whine of the machinery above them had dwindled to a mere hum.

The captain, still a little dazed from his efforts, came to life with a jerk. "My fault again!" he exclaimed.

He knelt suddenly and pulled a small switch at the side of the mechanism he had just operated so successfully. There was a crash in the central power plant above and the lights again resumed their brilliancy. It was Teddy's turn to act quickly for the Comet shot skyward with a terrific jerk at starting. His controls had been at their maximum setting and it took speedy movements to again establish equilibrium.

"What in the world?" said the professor.

The captain laughed in relief. "Why," he said, patting the machine with his hand as he would the head of a child, "this little baby takes just about all the power that is available on board the Comet and the requirements increase as the time of its operation is lengthened. I forgot to pull the switch after its work was finished and the voltage of the main generator pulled down rapidly as it became overloaded. So the Comet almost lost its driving energy and we nearly came a cropper amongst the ruins below. The crash you heard was the oil switch in the power plant, which disconnected the projector as I pulled the small controlling switch."

"Lucky you thought of it," said Steve drily, "but this projector is a new one on me. You didn't tell me about it when we were busy together on the other arms and ammunition."

"No, I didn't, Steve," admitted the captain. "In fact, I told no one, because I was not at all certain it would work. Lucky for us that it lived up to the expectation of our Ordnance Department back home."

"What sort of device is it?" asked the professor.

"I do not fully understand it myself," was the captain's reply. "It was developed secretly in our own Ordnance Department and had not been tested before we left. My superior was persuaded that our trip might offer ideal opportunities for the test, so it was arranged to send it along with us. As far as I have been informed, it is some sort of an energy projector that operates from a tremendous amount of power—something like a hundred thousand kilowatts—and the entire amount of power, *minus* losses, of course, is projected through the atmosphere and sets up enormous currents in any conducting objects at which it is directed. We simply melted the enemy vessel in an electric furnace, or rather we actually set its metals afire by concentrating a tremendous heat on a small portion of its surface."

"I still cannot reconcile it with science," said the professor, "I do not understand how such a large amount of power can be transmitted through air without heating it to incandescence and thus destroying the conduction of the medium. Of course, it may be that it gets its results by means of a bombardment of electrons, as is the case with the cathode ray projectors."

"Well," said the captain, "I'm not at all sure of the explanation. Possibly it is transmitted by induction rather than by conduction or by any ray or beam at all. At any rate it worked and we now know how to overcome the enemies of Coris."

The four Corisians were jubilant and lavished praise on their new friends from Tinus. Doctor DePolac stood thoughtfully gazing from one of the side windows. Suddenly he turned to the rest of the group with a startled exclamation.

"But what about the second raider?" he asked. "It was reported that two of the vessels of the Kellonians had landed on this island, wasn't it?"

His companions looked blank. In their joy over the one victory, they had completely forgotten the second raider.

"True," said Ralph, "and here we drift along doing nothing, while the other raiding party might be destroying half the island and thousands of inhabitants. Let's find them."

AGAIN all was anticipation. Teddy sent the Comet aloft and circled the island rapidly, looking for the second vessel. But at no other point over its considerable area were they able to discern evidence of additional activities of the Kellonians. Nowhere was there another sign of the smouldering blue fires that existed in the neighborhood of Palun, though they spent several hours at high speed in covering the ground carefully.

"This seems to be hopeless," said Ralph, as they again neared the scene of their victory. "Hadn't we better descend and try to get some news from the Tritu Leboru?"

"A most excellent suggestion," said Valdor. "Why not land the Comet in the great square of Palun? Any news there is will be obtainable immediately."

All members of the party concurred and it was not long before the Comet hovered over a large square similar to the one before the palace in Seritanis. The streets and moving ways were still crowded, though it was well toward morning. The population, with knowledge of the destruction of only one of the two raiding galdons, was evidently making a night of it, in anticipation of another attack. And what a reception the passengers of the Comet received when they stepped from their vessel to the brilliantly lighted square!

They were literally lifted from their feet and carried about by a mob of hysterical Corisians, who, for the first time in generations, saw a glimmering of hope of release from the suffering they had come to take for granted. It was a full hour before order was restored in the square and the visitors were allowed to make their wants known. They were showered with attention and the Vizal, or mayor of the city, conducted them to his own apartments for quiet and refreshment. There they obtained all the news, which was meager indeed, outside of the record of their own exploit, which had already been communicated to the entire globe. The remaining ship of the Kellonians had last been sighted, just before dusk, some six miles from the city of Kirus, the second largest city of the island. But there had been no further demonstrations and official circles were greatly concerned, since, in all previous raids, the enemy had made it a point to finish their work as expeditiously as possible and be off. It was feared that this was intended as a protracted siege and that the enemy was waiting only for daylight to commence operations on a tremendous scale.

But, with the news of the results of the battle between the Comet and the Kellonian vessel, the fears were greatly allayed, though the officials realized full well that the space ship could not be everywhere simultaneously, and that great damage could be wrought by the enemy at far points before they could be reached by the Tinusians. After conferring for some time, it was agreed that the Comet should cruise over the country in the neighborhood of Kirus, and that the Tritu Leboru should install one of their instruments and an operator on board, to enable the visitors to keep in touch with the news of Coris

and to reach in the shortest possible time any spot at which the raiders might be sighted. It was further arranged that a convoy of ten Corisian planes accompany the Comet, and as a final thought on the part of Ralph, these planes were each equipped with one of the small cathode ray projectors, and the pilots instructed in their use. These arrangements were completed just before dawn and the crowds in the square milled about in renewed excitement, when it became apparent that the visitors from Tinus were again to embark on a trip in their interest.

The fleet of Corisian planes was already circling the square when the last of the party had entered the Comet, and they made off in the direction of Kirus, just as dawn showed its first streamers of vivid color across the Corisian sky. The Comet followed immediately at the speed necessary in trailing their convoy. Lucky it was that the distance to Kirus was not more than three hundred miles since the speed of these planes seemed to be no more than four hundred miles an hour at the maximum.

Ralph and Margaret had stolen away from the rest of the party, and now sat in one of the side compartments, gazing from a window facing in the direction taken by the Corisian planes. The fleet ahead was a pretty sight as it shifted formation with changing breezes, then wove about and resumed the original positions in just the manner used in battle formation of planes used many years before on their own earth.

Margaret's head was on her tall lover's shoulder. She seemed perfectly content to be there with his strong arm encircling her waist. And the man seemed equally content. But they were both very, very tired and the story was told by their voices as they conversed in low tones. There was very little sleep for any of the visitors from the earth for several days.

"I'm so glad," said the girl, "that we have been able to do something for these people after all."

"I am, too," he replied, "and I was afraid for a while we should be able to do nothing but sympathize with them. This wonderful machine that French obtained from the Ordnance people solves the problem. We'll fix them now."

But Ralph spoke with too much confidence as he was soon to learn. As he and the girl watched the fleet ahead they suddenly saw the planes swoop to a lower altitude as if to examine something beneath them. Sure enough, only a mile ahead and not more than a mile below, hovered the shape of the second of the Kellonian ships.

Another battle was about to start.

CHAPTER XIII

Retaliation

MARGARET was overcome with an unexplainable foreboding as they descended the stairs and she clasped Ralph's hand convulsively and rose on tiptoes to bestow a kiss just before they entered the control room where the remainder of the party had assembled —all excepting Steve who was stationed at the side of the young and handsome operator from the Tritu Leboru, whose apparatus was installed in one of the cabins on the third floor above them. Poor Steve was smitten at first sight of the Corisian maiden and did not seem to feel at all embarrassed at the unfavorable comparison between her stature and his own.

At the approach of the Comet and its convoy of planes the second raider made no move to change the position it had taken directly over a sizable suburb of the city of Kirus. This was no doubt intentionally done by the enemy to make it difficult for attackers from above to use any weapons which would endanger the lives of their compatriots. But the fleet of planes swooped low and circled the vessel, this time using the new cathode ray weapons rather than their own machine guns. Little damage seemed to be accomplished by this maneuver, as none of the Kellonians were exposed to view, and the rays had no effect on the metal sides of the cigar-shaped ship. Realizing their error, the planes returned to the higher altitude where they circled the Comet as if asking for advice as to the next move to be made. But the occupants of the vessel from Tinus were as puzzled as were the occupants of the planes. They dared not use the energy with which they had destroyed the first vessel since they would thereby cause great loss of life and property in the village beneath. Swarms of the inhabitants could be seen in the streets of the town, evidently awaiting their fate with composure. And what else could they do? There was no escape, for if the blue flame was directed at them, they had no defense and there were no available means of locomotion sufficiently speedy to save them from their enemy. Thus it had been for decades—the harassed Corisians calmly awaiting the sacrifice they felt bound to make, to prevent reprisals such as had been suffered on other occasions of severe resistance to the raiders.

The usual procedure in a case of this sort would have been the paralyzing of the entire population of the village, when the raiders would descend and calmly help themselves to such of the inhabitants as they desired to destroy or carry away with them. But something different was brewing on this occasion. It was in the air, the occupants of the Comet "felt it in their bones." After a few minutes of indecision, Ralph thought suddenly of the radio, the apparatus which had been installed in the vessel and never used since they left the earth. He rushed to the operating room and switched on the current, headphones clamped to his ears. Swiftly he turned the dials of the short wave receiver, then of the one used for long waves. At about twenty thousand meters he heard the whistle of a continuous wave transmitter. Manipulating the oscillation control he cleared up the whistle and heard —voices!

He shouted aloud in his excitement and was quickly joined by Captain French who had been passing the door at the moment.

"What is it, old man?" asked the captain.

Ralph faced him and solemnly removed the headphones, placing them on the captain's head without replying.

"Good Lord, Prescott!" said the captain hoarsely. "Voices in a strange tongue. What can this mean?"

"The Kellonians," said Ralph solemnly. "I suspected they used radio and now my suspicion is confirmed."

"How on earth did you suspect this?"

"Possibly my eyes are a little better than those of the rest, but I did observe a maze of fine wires stretching the length of the enemy vessel and, in my limited knowledge of things scientific, all they suggested to me was the antenna system of a radio or television apparatus. It must be their voices we hear."

"Have you told the others?"

"Not yet. But I know what this means and so do you. They are communicating with their own home and calling for reinforcements. By the same token, they were in constant communication with their sister ship up to the time we destroyed it, and are undoubtedly prepared for our reception at this moment."

The captain nodded in agreement. "Let's go below and tell Teddy and the rest about your discovery," he suggested.

"Right," said Ralph, and the two clattered down the stairs to the control room, noisier than school boys.

AT the news imparted by Ralph and confirmed by the captain, Teddy looked gravely at the professor. "For all of our scientific knowledge and attainments," he said, "it remains for a layman to learn this important fact. And we are now faced with a serious dilemma. We

must wait for the next move to come from the enemy."

They had not long to wait, for at that moment Valdor looked from the window and shouted aloud in surprise.

The raider had started his flame generators and the blue death was upon the village beneath! They had not used the paralyzing rays, but had deliberately set out to draw an attack from the planes and from the strange spherical vessel above them. Wildly the pilots of the Corisian airplanes swooped to the attack spitting machine gun bullets into the sides of the raiding ship. Its tower raised quickly, but two of the Kellonians were shot down by the furious Corisians before a third managed to get the orange beacon into action. Then all was over for the brave airmen. It had happened so quickly that those on board the Comet were stupefied into inactivity. Then, with a roar like a bull, Ralph dashed for the energy projector.

"Come on, Cap," he bellowed. "Let's get them!"

The captain was at his side in a moment, turning the sighting controls with all the rapidity he could summon. But again they reckoned without the enemy.

Flashing into umbrella shape, there came a great cloud of purple smoke from the upper part of the raider, completely obscuring from the view of those above all that transpired below. And this cloud, ever billowing upward, enclosed the Comet in an impenetrable darkness. The captain cursed and Ralph raved and tore his hair. Teddy pulled at the levers savagely and the Comet shot upward and out of the cloud of dense vapor. Several of the portholes were open and the acrid fumes of the purple gas set the occupants to coughing and strangling.

"What a narrow escape!" exclaimed the professor as he wiped his eyes and took a cautious sniff of the now clearing air in the control room. "There's hydrocyanic acid in that stuff and we should all have been killed had we not escaped it immediately. These Kellonians are devils incarnate!"

Ralph still raged impotently. "Well, what's to be done now?" he stormed. "Their gas cloud is growing larger and larger and we haven't a chance in the world to get their range with any sort of ammunition."

"Well," said the captain slowly, "the village is done for now. How about dropping a few of our high explosive bombs into the center of the gas cloud?"

"Fine business," said Ralph. "Let's try it."

SEVERAL of the smaller bombs had been stored in a small magazine in the control room and these were brought out at once. But again it was too late, for the enemy vessel was speeding rapidly from under the spreading purple clouds. Already they were several miles away and the blue fire no longer seared the countryside. The defenders were in the same position as before and must perforce follow to see what move was next to be made by the Kellonians. By this time every occupant of the control room was in savage temper, the girls included. Steve hastened in with news from the Tritu Leboru. The village just annihilated was called Fara and was reported lost with all of its twenty-five hundred inhabitants. The Corisians in the group mourned openly and unashamed.

In a few moments the Comet had overtaken the fleeing Kellonians, but these took refuge immediately above another town, this one even larger than Fara. A council of war was in order on board the Comet. Evidently this was to be a game of watchful waiting. Teddy poised the ship some seven thousand feet above the enemy and adjusted the controls to maintain this position.

"Folks," said the professor, "this is a serious business, indeed, and we must use our wits to the best possible advantage for all concerned. To my way of thinking, the enemy is merely lying in wait for another of their vessels or possibly more than one to arrive and assist in further devilment. Unless a move is made by the galdon below, there will be nothing we can do until their reinforcements arrive. Most of us from Tinus are sadly in need of rest and sleep, and it is my suggestion that the girls retire at once, and that the rest of us arrange for regular watches of four hours' duration. Otherwise we shall be in no physical condition to perform our duty when the time comes."

Mary and Margaret made some objection to being classed differently from the men, but were quickly overruled, when the doctor chimed in with Teddy and Ralph in insisting on carrying out the professor's suggestion. Lots were drawn among the men and Teddy, Captain French, and the doctor left for their rooms. The professor took the controls while Ralph and Steve stationed themselves at the ports to keep an eye on the enemy. Romos, Valdor, and the two Corisian scientists remained in the control room with their new friends from Tinus.

Hour after hour the anxious group watched for signs of action on board the galdon, but none appeared. Ralph made frequent visits to the radio room to see if further use was being made of this means of communication by the enemy. Steve visited the Tritu Leboru operator often, and tarried with her longer than was necessary to learn the news from the outside. Coris was waiting breathlessly for developments and it was apparent that the faith of the Corisians was pinned entirely on the resourcefulness of the newcomers.

It was at the end of the second watch that the captain, who had taken over Ralph's job of listening for radio conversations, reported that the enemy was again in communication with someone. The language of the Kellonians was entirely unintelligible, but it was evident that considerable excitement prevailed among the occupants of the galdon. The voices were raised in anger and from their tone it was certain that the anticipated reinforcements were approaching. At first it was a one-sided conversation, but in a short time the captain was able to tune in the wave of the more distant transmitter and here he found a reassuring tone in the voices of the several speakers. Orders seemed to be issued, though this could be judged only by the inflections of the voices. Then all was still once more.

Teddy received the captain's news gravely and at the next change of watch communicated it to Ralph and the professor.

"And we have no means of knowing how soon to expect these reinforcements nor how many of the galdons might be approaching," he concluded.

"There have previously been but three," interjected Romos.

"Yes," said Ralph, "but these fiends may have a great number of the ships for all we know. And if they attack in numbers we will not have much chance. As I see it, we are between two fires. If we destroy the ship below us we shall be free to go after those now approaching, but great loss of life will result in the village and we should avoid causing this if it is at all possible."

"We must avoid it," agreed Teddy, "and if we leave our present position and sally forth to meet the reinforcements the galdon below will proceed to destroy the village anyway. We certainly are between the devil and the deep blue sea."

"May I suggest something," asked Captain French.

"Sure thing," said Ralph and Teddy, hopefully.

"Our cathode ray projectors are not much use except in hand-to-hand encounters," said the captain. "The big projector here in the control room is needed for destroying enemies beneath us when the time comes. But the reinforcements will undoubtedly approach us from the heavens and we must be protected from above. In our stores we have an old type anti-aircraft gun of only one inch bore, but it can be fired very rapidly, and I have prepared a hundred shells using the new high explosive,

which should prove very effective against the ships of the Kellonians. Our friends here in Coris learned years ago that their own ray projectors were of no avail against the armament of the galdons, but I have an idea that our high explosive shells will be, and I should like to try it."

RALPH was immediately enthusiastic and Teddy agreed that it was at least a good thing to try. The Corisian scientists were extremely interested in the tremendously powerful explosive they had seen employed against the first raider, and volunteered to assist in the setting up and manning of the gun in the upper compartment of the Comet.

"But," objected the professor, "if you should prove successful with this gun you will be likely to cause the very damage and loss of life beneath us that we have been trying to avoid."

Captain French grinned. "If it works as I think it will," he said, "there will not be much left of these galdons to fall on our friends below. You saw the terrific effect of the small hand grenade I hurled at the first one?"

"Yes, indeed," said the professor.

"Well," said the captain, "if one of these one inch shells penetrates the armor of a galdon and explodes within, the force will be so great that the Corisians below will receive only a hailstorm of pulverized particles too small to do any damage. Wait and see."

The professor was infected by his enthusiasm. "My objections are withdrawn," he said, "and I hope you are right. Go to it."

So Ralph and the captain, accompanied by the two Corisians, repaired to the upper compartment and lugged out the case which held the old-fashioned weapon with the new ammunition. It was quite a problem to mount the weapon so that it could be used in any direction, but this was finally solved by opening the great central port in the dome-shaped ceiling of the upper compartment and erecting a light platform close to this point with the muzzle of the gun projecting into the open air. It was then found that the gun could be swung around to all points of the horizon as well as covering the entire heavens above. When the work was completed, Ralph and the captain expressed their satisfaction, and Castrini and Lorver enthused over the details of the gun's mechanism.

Then came the wait for the arrival of the Kellonian reinforcements and the captain produced a binocular with which they scanned the heavens incessantly.

The wait was of less than an hour's duration, for within that time two of the galdons were sighted by Castrini, who excitedly pointed them out to his companions. The two ships were approaching Coris from the northeast, and when sighted, were about eight miles from the Comet, towards which they were heading at a fairly swift pace. The captain stationed himself at the telescopic sight of the gun and swung its muzzle around in the direction from which the galdons were approaching, side by side.

Meanwhile Teddy had an idea; he hastened to the operator from the Tritu Leboru and instructed her to send out word that it was desired that the village be evacuated by the populace. Teddy felt certain that the village was doomed, anyhow, as far as loss of the property was concerned, and he wanted as great a number of the inhabitants as possible to be spared. The exodus commenced at once and the observers in the control room could make out the streams of humanity fleeing from the town along the several roads passing through it. This move was entirely unexpected by the raider beneath them, as excited conversation over the radio immediately indicated. They seemed undecided as to what action to take and consequently took none. Teddy exulted at the success of the move.

The two galdons nearing the scene from above had slowed down and separated, with the obvious intention of attacking the Comet from different directions and getting their blue fire at work on its upper surface. To Ralph it seemed that the captain had delayed an unduly long time. The gun was loaded with one of the long shiny cartridges which carried the deadly explosive in pointed steel shells. The captain, with his eye glued to the sight, spoke sharply:

"Stand by now!"

He pressed the firing lever and immediately thrust another cartridge into the breech of the gun. Ralph held one of these in each hand as did Castrini and Lorver, each ready to pass them to the captain when required. But the first shot took effect on the nearest of the two galdons, and the Comet rocked and lurched with the force of the tremendous explosion that resulted. The attacking ship was blasted into countless fragments just as the captain had predicted and the air was filled with a veritable cloudburst of the wreckage. The second galdon fled precipitately to the south, putting on such speed that she was lost to view in a very few seconds.

"One!" exulted Ralph, "and we'll get the other later. Let's go below and see what's doing down there."

They hurried to the control room where they imparted their news to Teddy who had already assumed that they were successful on account of the concussion and the rain of fragments. In turn they were advised of the evacuation of the village, and, by the time they reached the control room windows, the galdon below had started another of the purple smoke screens, and the Comet was forced to retire to a greater altitude momentarily. But this time all the ports were closed and they soon returned to the attack, dropping below the gas cloud in a very few moments. There they found the galdon scudding away rapidly, hugging the ground with its flame generators tearing things up as usual.

This time the raider was headed for the open country, apparently demoralized by the destruction of its newly arrived companion. Teddy gleefully manipulated the controls and the Comet was soon at the stern of the galdon, which now had put the orange beacon into operation as well as the flame generators. The gas cloud was soon left behind and Ralph opened one of the ports with the intention of hurling a high explosive bomb at the raider. As he did so there was a gasp behind him, and Steve Gillette slumped to the floor in a crumpled heap.

"Close that port!" shouted the professor.

RALPH realized at once what had happened and kept out of line of the opening as he slammed the transparent but insulating cover home. He knelt over the crumpled form of Steve contritely, finding him completely paralyzed and with glazing eyes popping from their sockets.

"Do not fear," said Romos, "he will recover. But it will be after many hours of suffering."

Ralph and the rest were much relieved at this, but at once became aroused to the necessity of attacking the enemy in a different manner. The girls had been awakened from their slumber by the explosion which destroyed the other galdon, and they now made their appearance. The captain had again vanished and now returned with an odd costume. He was completely accoutered in a lead suit of protective armor. Sheets of the metal, overlapping neatly, covered the entire front of his body and his head was encased in a huge helmet of the same material, his eyes twinkling through large discs of the insulating transparent material, such as had been used for the windows and port covers of the Comet. His laugh echoed faintly and hollowly at the surprise of the group.

Ralph caught the idea at once and hastened to place two of the small high-explosive bombs in the captain's lead-gloved hands.

"What is it?" asked Margaret, "and what has happened

to Steve?" She had observed his weirdly crumpled form on the floor.

"The paralyzing rays," said Ralph. "And now we are going to destroy another of the galdons."

He rushed to the port where the fleeing vessel could be seen only about fifty feet below and slightly ahead of the Comet.

"Stand back!" he ordered and everyone retreated from the vicinity of the port.

As the captain approached the opening, a bomb in either hand, Ralph swung back the transparent circular window, taking great care to keep his body out of line of the paralyzing emanations from the orange beacon.

The captain poised for a moment and drew back his right arm. It was difficult to throw even so small an object, hampered as he was by his heavy garment, so Teddy maneuvered the Comet directly above the galdon. The bomb was let fall and the captain signaled wildly for Teddy to rise. Ralph slammed the port cover shut just as the explosion occurred, and was immediately catapulted to the other side of the control room by the force of the concussion. Teddy had been quick at the controls, but the Comet had only risen about five hundred feet by the time the explosion took place. All occupants of the control room were thrown to the floor, where they lay momentarily stunned by the shock. It was several moments before Ralph dragged himself to one of the floor ports and shouted:

"Look!"

One by one they reached the ports and gazed on the scene below. The raider had been neatly cut in two, the two ends of the vessel lying twisted and torn at the opposite sides of a great crater which had been blasted out of the ground beneath. The entire center section had disappeared.

"Believe me," said Ralph, with awe in his voice, "that's some explosive, Cap."

THE orange beacon was gone, blasted into nothingness, as was the blue fire. Nothing remained but the twisted metal ends of the vessel. But from the forward section of these something was emerging—a horrible writhing something that sent a shudder through the witnesses one and all. It was the mangled remains of one of the Kellonians, wriggling and pushing to escape from its confinement.

Mary voiced her disgust and turned her eyes from the scene. Margaret breathed hard, and joined her lover at the port at which he now stood.

"Ralph, dear," she said, "can it be that any of these horrible creatures still live down there?"

"Hardly," he answered, "—not after that explosion."

But, even as he spoke, one of the creatures emerged after the writhing body of its dying companion had fallen to the bottom of the newly-made crater. This one seemed to be whole and very much alive, though extremely sluggish of movement; but that was true of all its fellows.

"Well, I'm hanged," said Teddy, "if one of them didn't escape!"

Ralph was galvanized into rapid speech. "Let's capture him, or it, or whatever you want to call the creature," he said. "I've an idea that maybe we may be able to learn something, even though we do not know its language."

There was a chorus of dissent, but Ralph was so insistent, that Teddy finally maneuvered the Comet to a landing at the edge of the crater. By this time the ferocious and ungainly Kellonian was scrambling to escape, but so slow were its movements that a child could have overtaken it.

"Who's going to make the capture?" asked Teddy drily.

"I am, said Ralph, "but we'll get help. Get the Tritu Leboru operator to spread the news and ask for nearby towns to send volunteers to this spot. In the meantime, someone had better go to the upper compartment to watch for a possible return of the other galdon."

"Right," said Teddy, leaving the controls and starting for the room where the news operator was located.

The captain left for the upper compartment, while the four Corisians prepared to accompany Ralph on his venture against the lone Kellonian. They picked up their cathode ray projectors and fingered them lovingly.

"We can't use those," said Ralph shortly. "We must capture this fellow alive."

"But how are you going to do it?" asked the professor.

"I don't know yet," Ralph replied, "but we'll find a way."

"I'm going with you," said Margaret.

Ralph started to reply heatedly, then made a gesture of futility.

"All right, sweetheart," he said. "You will have your way finally, so I suppose there is no use arguing."

By this time the porthole was open and the Corisian members of the party had emerged on their own soil. Ralph and Margaret followed and were soon joined by Doctor DePolac and the professor.

The doctor drew Ralph aside. "What's your idea?" he asked seriously.

"I'll tell you later, Doc," was the reply, "but you will have something to do with this yourself. And we must get this baby alive."

THE doctor grunted his disgust and disbelief as he watched the great lumbering figure of the Kellonian moving in a southwest direction at a snail's pace. The creature was not more than two hundred yards from the crater and was evidently panic-stricken and dazed. Viewed from this distance it was a terrifying creature and Margaret, for all her bravery, clung to Ralph's hand as she watched. The great black body was fully twenty feet across and it moved with quiverings and shakings like a jelly-fish. But the tentacles—more than fifty of them by the look—writhed and waved in frenzy, clutching at trees, roots, shrubs, anything at which they could grasp. Each tentacle was as long as the ugly body and the creature gave the appearance of a cuttlefish of huge and terrifying aspect. Occasionally it turned and glared balefully at its pursuers.

Villagers began to arrive from the surrounding territory and, one and all, they stopped short in amazement when they witnessed what was occurring. Hundreds were now on hand and they completely surrounded their enemy in a short time. But what to do with this vast creature, how to capture him with safety to themselves, they did not know.

"I have it!" said Ralph, drawing his ray projector from its sheath. "I'll burn off a few of those tentacles to show him we mean business. Then we'll drive him back to the crater and keep him there until ropes or a net can be brought to confine him safely."

He issued his orders with celerity and they were passed along the line of Corisians until all knew what his intentions were. Several of the Corisians had backed up to escape the swinging tentacles of the monster, but his progress was so slow that the retreat did not mean much. Ralph ran to a point on the far side of the creature and then stationed himself directly in its line of progress. He raised his ray projector and aimed for one of the huge tentacles at the point where it joined the disgusting body. The ray shot forth and the tentacle seemed to melt from the body as if burned away by strong acid. It fell writhing to the ground and the Kellonian screamed with rage and pain. Again and again the ray sped forth and at each contact a tentacle followed its writhing fellows. As he pressed the button that released the energy Ralph walked boldly toward the horrid creature, which glared malignantly at him from those large, red-rimmed eyes.

Another tentacle lost, and the creature turned about and lumbered away in the direction of the crater left by the explosion. Relentlessly Ralph followed, occasionally searing the Kellonian anew with the death ray. The brute now whimpered like a baby and, sobbing and screaming, tumbled over the edge of the crater to land in a flopping heap at the bottom.

Hundreds of Corisians crowded the edges of the crater, howling their glee and heaping curses on their captured enemy.

So intent were they on the little drama being enacted on the ground that not an eye had raised heavenward. Momentary fear gripped the hearts of the assembled Corisians when their ears were suddenly assailed by the sound of a terrific explosion overhead. With one accord all eyes turned skyward just in time to see the huge burst of flying particles that marked the last of the galdons. The captain's aim was perfect.

The captured Kellonian whimpered and blubbered in his prison at the bottom of the crater as cheers and shrieks of joy rent the Corisian air.

CHAPTER XIV

Research and Conjecture

WHEN the Comet returned to Seritanis there was a great celebration in honor of the visitors from Tinus. But Ralph was all wrought up over his idea and insisted on an immediate consultation with the Corisian scientists. Thalia had greeted them in person and showered them with her thanks, but she was quick to accede to Ralph's request and called an immediate meeting of the most noted scientists of her realm.

Margaret was all excitement, as she felt that Ralph had something momentous to disclose. His companions were mystified but confident that he knew what he was about, so when the meeting was called to order, they all listened with grave attention.

"Friends," spoke Ralph, "I am no scientist in any sense of the word but I do believe that further action is necessary at once in this matter of the Kellonians. We have destroyed four of their galdons and have captured one of their number alive, though somewhat damaged.

"This is, of course, a signal victory, but it is only the beginning of things as I see it. Who knows how many of these space ships the enemy have built or have under construction? Perhaps more are even now on their way here?"

No answers were vouchsafed and everyone in the council chamber sat with a grave countenance. In the heat of victory this phase of the matter had been almost forgotten. The silence was complete as Ralph continued further:

"None of your astronomers have been able to discover the abode of the Kellonians, though they have been trying to do so for years. But, until this is done, you have no assurance that the enemy will not return. In fact, with no news coming from the four galdons recently despatched, they may send out dozens more of these ships and destroy Coris completely in reprisal. So there is but one course open if Coris is to be saved. The abode of the enemy must be discovered and they must be destroyed before they have the opportunity of completely destroying you."

He hesitated and the chamber was intensely silent for a minute or more. Then Thalia spoke:

"Know you how this great feat is to be accomplished?" she asked gently.

"No, fair Thalia," Ralph replied, "but my own idea is this: We have captured one of the enemy. His language is unknown on Coris and his thoughts unreadable by your people. But with us is Doctor DePolac, greatest of all psychiatrists on Tinus, as you call our Earth. He has brought with him an instrument which enables him to read the mind of a patient with accuracy and without the patient's volition. It is my first proposal that we allow the doctor to experiment on this monster and endeavor to obtain knowledge of his home and of its location."

The doctor sat suddenly erect with a startled exclamation. The council chamber buzzed with animated discussion. Thalia raised her hand and all was again silent.

"Excellent, my dear Ralph," quoth Thalia, "continue."

"As I said before," spoke Ralph, "I am no scientist. I am a business man. It seems to me that war is a business and must be run like any other business. We have with us, besides the doctor, one of the great astronomers of Tinus, one of the most expert authorities on armament, and the greatest authority on air travel. You have great scientists here too. But the work of these must be coordinated, just as in any business venture. Each has his own sphere, and is guided mainly by his experience and thoughts along certain more or less constricted lines. It is my humble suggestion that the coordination of these great minds be left to my responsibility, mainly for the reason that my own experience and training have been along the very line of coordinating the work of other and greater minds."

There was an instant chorus of acclaim and assent. The professor was first to grasp Ralph's hand and he wrung it heartily. Thalia rose to her full height of majesty. She smiled.

"It shall be as you desire," she said, "as far as my own people are concerned. And, from the demonstrations of your own companions, it appears that they, too, are prepared to follow your leadership."

Ralph blushed like a girl when Margaret rushed to his side and, all unheeding of the curious eyes of the crowd, planted a resounding kiss on his cheek.

"You are wonderful," she breathed into his ear. "I just knew you would do it, dear."

BEFORE the meeting broke up, Ralph called for the three most expert scientists in the domain, one an astronomer, one an expert in mental study, and the third a chemist. By Thalia there were selected in the order named, Torvan, Rastor, and Soltur, and these three Ralph called into immediate conference with Teddy, Doctor DePolac, Captain French, and the professor.

When the door to a smaller chamber had closed behind them and all had taken seats around a large table, Ralph, at its head, continued his talk.

"Friends," he said, "please pardon my assumption of authority and do not consider it as such. It is merely that a leader is required in order to obtain quick action, and I, obviously unsuited for the actual business of thinking and planning scientifically, have the greatest amount of time for organizing and leading the expedition which I am convinced must be made.

"Action must be quick for reasons I named in the council chamber. First, there is the prisoner to be examined. That is the work of Doctor DePolac and Rastor, and should be started immediately. It is my thought that with the doctor's electro-telepathoscope and the use of mental suggestion, or possibly by merely waiting for voluntary thoughts of the prisoner, some idea as to the nature and location of his domain may be obtained.

"Secondly, there is the absolute necessity of locating the abode of the Kellonians. That will be up to Professor Timken and Torvan. How this can be accomplished I do not know, but surely the combination of astronomical knowledge from natives of Tinus and of Coris should produce results, especially if supplemented by information obtained from the brain of our loathsome prisoner.

"Lastly, there is the need of devising means of destroying the home of the Kellonians, when we have found it

and reached it, this being up to Captain French and Soltur. For my own part I have great confidence in the energy projector brought from Tinus and in the powerful explosive. It is my thought that the instrument might be duplicated here and that the explosive might also be produced in great quantities. We already have the means of reaching the planet inhabited by the enemy, thanks to Teddy Crowley. His job is to command the Comet and its movements. My job is only that of organizer and commander-in-chief in battle. The technical knowledge and the necessary tools are to be provided by the rest of you. Are you all in agreement?"

There was not a dissenting voice—in fact there was much commendation of Ralph's plan and of his own ideas on the matter. The professor left immediately for the Royal Observatory with Torvan. Doctor DePolac and Rastor made immediate plans for the examination of the prisoner. Captain French and Soltur left for one of the large chemical laboratories. Ralph and Teddy remained behind and indulged in some further conversation.

"Some nerve I have," laughed Ralph.

"That's just what we need," said Teddy, "nerve with a capital N. The trouble with most of us who are scientists and engineers is, that we are immersed in our own particular branch of science so deeply, that much else escapes us and we are unable to decide things on the spur of the moment, and that is just as necessary in warfare as in business. You summed the situation up accurately and have, I think, done the right thing. We are all in agreement with you and will follow your decisions to the end."

"Thanks, old man," said Ralph simply, "and now let's see what will happen. I can't understand why this planet has not already been located, but I think we are on the right track."

SOME time later, in a sunken concrete chamber on the outskirts of Seritanis, there sat the doctor with Rastor, Ralph, and Teddy. Before them was the screen of the electro-telepathoscope and over their heads were the cap-like contrivances with the trailing wires which connected with the main portion of the apparatus in the adjoining chamber. In that adjoining cell reposed the huge bulk of the captured Kellonian, firmly bound with cables and with a great cage-like structure surrounding the heaving body which also was its head. The cage was connected with the doctor's instrument and had been constructed to collect the thoughts from the brain of the ungainly creature to be conveyed to the mechanism of the electro-telepathoscope, in the same manner as was done with the smaller caps worn by mortals subjected to the same process.

On the screen there was a rapid succession of pictures horrible to contemplate—orgies of hundreds of the Kellonians in which captured Corisians were tortured and finally consumed—details of Kellonian life, evidently much of the family life of the subject—interiors of great caverns where the light of day never penetrated, but where all was illuminated by a sort of phosphorescence, apparently given off by the cavern walls—views of mining operations and of the slavery of many Corisians on the remote planet. But for hours there had been no suggestion of the location or nature of the planet itself.

And the impressed thoughts in the minds of the observers—the thoughts accompanying the visual representations—were terrible in the extreme. Lucky it was that all in the room were of hardy mold and not easily upset. A squeamish person would not have lasted very long in the atmosphere produced by the filthy revelations from the brain of the creature they had captured.

When they were about to give up hope for the day, the scene and impressed thoughts changed suddenly and the observers became acutely aware that the detestable captive was homesick. His pangs of lonesomeness were impressed vividly on their minds, and they felt a bit softer toward the unfortunate beast. Now he seemed to be dreaming of his far-off home in terms of affection—the first sign of humanlike emotion yet observed. The doctor crept into the monster's prison and found that he had indeed fallen asleep. When he returned to the screen, his companions were greatly excited.

There on the screen was pictured one of the galdons and the prisoner was, in his dreams, entering the vessel, which was to return him to the home for which he yearned. With the creature the observers entered the vessel in thought and became immediately aware of some of the features of its internal construction. Then there was a blank space of no impressed thoughts, and suddenly they were out in the vastness of space, speeding heavenward with the homesick Kellonian. This vision did not last for any great time but the impression of joy at nearing home became acute and overpowering just as the motion of the galdon seemed to slow down as if for a landing.

It seemed they were about to land, though no planet or other body had become visible up to this time. Below them, where there should have appeared the surface of a planet, all was blackness. Then it suddenly dawned on them that the stars in the firmament became blotted out by some vast intervening object, but the object itself was entirely invisible. Slower and slower became the motion of the galdon and there was the sensation of dropping gently to the ground. Then, just before the landing was made, the surface was seen dimly. What a country! There were fleeting glimpses of an ebon landscape cut up and broken as no landscape had ever been before. An endless vista of jet-black stalagmites seemed to cover the surface, pointed black spires in close formation rising skyward to a height of a hundred feet or more. Then, with a gentle bump, the vessel had landed.

There was a pause and considerable attending excitement within the galdon. The vessel was resting in a cradle and this cradle dropped them suddenly with the sensation of descending in a high-speed elevator. Down, down they went into the depths of a yawning black pit. Faster and faster became the motion. Then there was a stop for a short period, when the motion again started and the phosphorescent light appeared on all sides as they emerged into one of the huge caverns of the earlier thought-pictures. At last the vessel came to rest and then the slits in its side opened and the slimy occupants tumbled out. The impression of happiness conveyed from the brain of the monster slumbering in his adjoining cell faded from the disc and from their consciousness, leaving the little company aghast and staring at one another in the dimmed light.

"No wonder the astronomers could not locate it," exclaimed Ralph. "It is an invisible planet. We must advise the professor at once."

The doctor was very much pleased with the result of the examination and accepted with aplomb the congratulations and praise of Rastor, who had not yet ceased to marvel at the mechanism which had been brought from Tinus. Ralph and Teddy were jubilant and hastened with all speed to apprise the professor and Torvan of the success of the experiment.

On their way they stopped in at the hospital where poor Steve had been taken after the return to Seritanis and were overjoyed to learn that he showed signs of returning consciousness.

TORVAN and the professor were deeply engaged in poring over the records of Corisian astronomical observations when Ralph and Teddy reached the observatory. The doctor had suddenly became greatly fatigued and had returned to his quarters for a period of well-

earned rest. Rastor had likewise left the party and returned to his own home.

"The doctor has been successful," exulted Ralph as the professor greeted them abstractedly.

"Yes?" said the professor, "and what did he learn?"

"That the Kellonians inhabit an invisible planet."

"Invisible?"

"Positively," said Ralph. "Why, we accompanied the prisoner in a dream visit to his own home that was so realistic that I for one felt all the thrills of a real voyage. And the planet was absolutely invisible until we were within a few thousand feet of its surface."

"I do not understand," said the professor.

Ralph explained, giving the details of their experience with the electro-telepathoscope minutely. When the story was done, the professor scratched his head in perplexity.

"Now, how are we to locate this place?" he asked of no one in particular. "No wonder our friends here could not find it with their telescopes."

He paced the floor in deep thought while Torvan peered through his thick glasses at the young men who had brought the news.

"You say that the surface of this planet appeared to be of dull black color and that it was deeply indented and of rough contour?" asked the professor.

"Rough contour!" exclaimed Ralph. "Why, Professor, the surface looked like the back of a porcupine!"

"Hm—hm," mused the professor, "then the albedo of the body will be extremely small, probably closely approaching zero—that is, unless there is a considerable atmosphere surrounding it."

"What on earth is an albedo?" asked Ralph.

"The albedo of a celestial body is the ratio of the light it reflects to that which it receives. A body such as that which you describe, might be likened to a piece of black velvet which reflects very little light on account of its deep pile. But, in the case of a celestial body, the amount of light reflected depends also upon whether the body is surrounded by a cloud-filled atmosphere. Those having little or no atmosphere and a rough surface, like our own moon, have a low albedo, while one covered with an atmosphere, especially if it be filled with partially condensed water vapor, forming clouds or mist, has a high reflecting power. This would point to the conclusion that the planet from which the Kellonians came has practically no atmosphere surrounding it."

"But how can they breathe?" asked Ralph.

"I believe you mentioned that the galdon descended into a pit or shaft and did not open its ports until it was far beneath the surface of the planet?"

"Yes."

"Then these creatures evidently inhabit the interior of the body and quite possibly produce their own oxygen within the populated caverns. For all their monstrous appearance, we must concede that they are possessed of great brain power and scientific attainments. It is quite reasonable to suppose that this planet of theirs has at one time gone through about the same process of evolution as that of the known bodies—that through thousands of centuries it gradually cooled and lost the power of supporting life on its surface—that its atmosphere became gradually more and more rarefied until finally it disappeared entirely. Intelligent beings, the forebears of the Kellonians, would have searched for means of prolonging the life of their race, and would naturally have taken to the interior of their planet, either to natural caverns and recesses, or to vast mining operations of their own. Here they would find warmth and could produce an atmosphere of any desired density by artificial means. Sub-surface lakes and seas, as well as vegetation, would be discovered. It is even possible that underground recesses contained lesser animal life, which could be utilized to the advantage of the more intelligent beings."

"That is quite possible," said Torvan. "Many centuries ago, when Coris was overpopulated, our people had already cultivated vast underground tracts and much of our food supply was obtained from such sources. Of course, that is no longer necessary and the workings have long since been abandoned."

"These theories might explain the invisibility of the planet," said Ralph, "but they do not help much in locating it. It seems to me that no time should be lost in searching for the body and you astronomical sharks ought to be able to find some way of doing this."

"Undoubtedly we shall," said the professor, "but it is by theorizing and checking theory with mathematics and observation that such things are accomplished. And I fear we shall require some little time. We have taken a step in the right direction by following the Kellonian in dreams to his own abode, but it is still only a step. Much remains to be done and great labor is involved. However, we shall do our best, Torvan and I, and you had better leave us to our task."

"No sooner said than done," laughed Ralph. "It is all over my head anyway, so Teddy and I will run along."

WHEN the younger men had left, the professor stared long and earnestly into the eyes of his newfound friend, Torvan.

"Where shall we begin?" he asked.

Torvan hesitated. "There is so much—so infinite is the universe and so many the possibilities," he said. "The question, as to whether there were undiscovered planets in our own solar system has long been considered by the astronomers of Coris as definitely settled. We have believed that none exist and have assumed that the Kellonians came from a familiar planet or from some system other than our own."

"But," said the professor, "that decision can scarcely be possible in the light of our recent experience. The reinforcements called for by the second of the first raiders could not possibly have reached us from another system in the few hours they took to come to the aid of their fellows. Their home must be located in our own solar system."

"It would seem that way," agreed Torvan, "but where and how are we to search for a body that is invisible to our powerful telescopes?"

"We must locate it by mathematical means, Torvan, though I confess I do not know how to start. Let us first marshal the known facts and then proceed to the best of our ability. First, we may assume that the body is of small size. This is indicated by the slow and painful movements of the Kellonians while on the surface of Coris. These creatures are of enormous size and weight here, but they must certainly be capable of swifter movement in their own environment. Their home might easily be of such small size and low density that its surface gravity would be only a quarter of ours, perhaps even less. That would account for their great difficulty of locomotion here. We may therefore expect to find that they inhabit a body considerably smaller in size than the planet Mars, which you call Non. Do you agree?"

"Yes, Professor. And it has even occurred to me that this body might be a satellite of one of our known planets."

"Quite possible," the professor agreed, "and it might even be a satellite of Coris."

Torvan stared. "That had not occurred to me," he said slowly, "but it is certainly within the bounds of possibility."

"Have you a theory of tidal forces and tidal evolution?"

"Yes, indeed," replied Torvan, "of course the tidal forces acting on Coris are almost entirely from Ku, which you call the Sun. Our tides are of comparatively small magnitude but are easily reconciled with the forces of

Ku. There are some outside influences, of course, but these are almost negligible."

"The problems of considering tidal forces on our own earth are extremely complicated," said the professor, "since the main force is from our satellite, the moon. There are, however, the addition of forces due to the sun, which is much farther from us than from Coris. Then there are the further complications of the varying distances of the moon and the sun north or south of the celestial equator, their changing distances from the earth and more especially the irregular contours of the continents and varying depths of the oceans. Still, with observational data established in many localities, we have reconciled our predictions of tidal movements, for the tides vary in perfect harmony with the know tidal forces influenced by other factors. Similarly, it appears that you have reconciled your tidal movements with the forces exerted by the sun. Are there no other forces in measurable degree?"

"We have always considered them negligible. But they are definitely indicated in our calculations and you may consider them if you think it is advisable."

"I do," said the professor, "and I presume you have also on file accurate calculations of the movements of Coris during the past century—the irregularities of its orbit and the changes, if any, due to tidal evolution or other factors?"

"We have very complete and accurate data," said Torvan, "and I begin to see the trend of your thought. You are considering the probability of this home of the Kellonians actually being a satellite of Coris."

"I am. You undoubtedly knew my thoughts before I spoke, but I can't get over the habit of expressing them completely. If this body is a satellite of Coris we are bound to locate it, for astronomy is an exact science. The movements of the celestial bodies are subject to unalterable laws. Each body in our solar system has a definite mass and momentum and its movements are controlled by forces which can be calculated to a nicety. Matter is indestructible, and none of the energy of the system can be lost though it be transferred and retransferred from body to body in varying amounts. All can be accounted for, and since we have a definite mass to account for and locate, we will be able to do so by locating the unaccounted for discrepancies in planetary orbits and in tidal effects on Coris."

The professor rolled up his sleeves as Torvan drew forth several charts and a number of large volumes.

CHAPTER XV

The Professor Triumphs

MANY days passed and Ralph chafed with impatience at the delay. He made daily visits to the radio room of the Comet and listened for communications intended for the Kellonians who had come to Coris. Surely, he thought, those left behind would be expecting news from the two expeditions. But day after day the ether yielded no sound that would indicate this, though he searched carefully over the full wave-length range of the Comet's two receivers. He made daily trips to the Royal Observatory, where he observed the labors of the professor and Torvan, who were now supplemented by a corps of Corisian assistants, astronomers, and mathematicians. The professor was looking peaked and wan, for he worked incessantly, only pausing for nourishment and occasional short snatches of sleep. Torvan, too, was an indefatigable worker, and he and the professor seemed to have formed a bond of friendship such as can be formed only between scientists who have one great common interest.

The Kellonian prisoner was subjected to almost hourly examination with the electro-telepathoscope and the doctor found his time practically filled with this work. Rastor and the other Corisian students of the mind found great interest in the proceedings and admired greatly the apparatus which made possible a contact for thought transferrence, which they had never been able to obtain by sheer force of mind. This mechanical contact was something new to them, and of great interest, though the doctor privately was just as much mystified by their means of establishing distant contact for the service of the Tritu Leboru. An interchange of ideas gradually brought about a more complete understanding on both sides and both the Tinusian and the Corisian experts stored away much in their own minds for future reference. But nothing of further value was learned in these investigations, though every waking and sub-conscious thought of the Kellonian was on record.

Steve had fully recovered from his experience with the paralyzing energy of the Kellonians and had joined the captain in his work with Soltur in the chemical laboratory. The high explosive had been duplicated after considerable experimentation, and the laboratory workers were now engaged in producing the powerful material in considerable quantity. This was being sealed into canisters of about a hundred pounds each, and already forty of these canisters had been stored in the magazines of the Comet. The energy projector, which had been used in destroying the first of the galdons, was disassembled by Corisian workers and detail drawings of its various parts were soon completed. But here they encountered a great difficulty, for much of its mechanism was of necessity constructed of iron and this was an extremely rare commodity in Coris. It was only after great effort on the part of Thalia's commissioners, that sufficient precious metal was obtained to construct a single duplicate of the machine. This duplicate was successful and justified their trouble.

Margaret and Mary indulged in a perfect orgy of shopping, or rather of visiting the various shopping centers and feasting their eyes on the gorgeous exhibits of feminine finery. They had never seen the like of those materials. They were of such fine texture and beauty of design, that they gloated in anticipation of the sensation they would create in their own home city, when they appeared in gowns of this material. On these tours they were accompanied by two ladies of Thalia's court and the Corisian ladies were much pleased at the extreme interest and pleasure evinced by their visitors. During this period Mary's notebook and pencil were by no means idle. Her sixth book of notes had been completely filled and she found it necessary to visit a Corisian stationer to obtain additional writing paraphernalia. She was surprised to find that the paper in use on Coris, while not produced from wood pulp, was quite similar in texture and surface to that of her own earth. And it was bound into volumes in much the same way as the books she had been using.

TEDDY busied himself—when he was not with Mary—in going over the machinery of the Comet to insure its being in perfect condition for the new trip which must soon be taken. He tightened a bolt here, replaced a terminal there, and checked over the wiring and electrical connections carefully to assure himself that all was in order. On the eighteenth day after the destruction of the last of the four galdons he happened into the radio room and twirled the dials of the long wave receiver. Ralph had gone through the same performance only a few hours previously without result but now there was something on the air. At about fifteen thousand meters Teddy found the unmistakable whistle of an oscillating transmitter and he waited patiently until a voice was distinguished. It was faint, but clear, and monotonously came the words, "Rogo Lodin Navon," repeated over and over. Then all was silence for a few minutes and then the same call came

again. Beyond doubt the Kellonians were seeking news of the expedition! Teddy hastened from the vessel and rushed to the palace to communicate his news to Ralph.

He located Ralph in his own quarters and was astonished to see his friend sitting with head bowed in his hands, apparently in deep dejection.

"What is wrong, old man?" he asked, as Ralph raised a haggard face to meet his gaze.

"Margaret," said Ralph, huskily.

"What about Margaret?" asked Teddy, his mission forgotten for the moment.

"She is taken seriously ill," was the unexpected reply. "She is stricken with one of the most dangerous of the Corisian fevers. Disease here has, you know, been almost conquered, but our constitutions do not have the required resistance. And Margaret is the victim!"

He spoke bitterly, almost vengefully.

"But, Ralph," said Teddy, "surely this fever is not likely to be fatal?"

"The court physician assures me it can be cured and that I need not fear for Margaret's safety. But I am much worried all the same. If you could only see her—how she tosses and raves in delirium—how unnaturally her eyes shine with the fever that is burning her up—you too, would worry."

"Where is she?" asked Teddy sympathetically.

"In her own chambers, attended by the queen's own doctors and nurses," replied Ralph.

"And where is Mary?"

"She is at her side continually—brave girl."

It was Teddy's turn to appear concerned. "Is this fever contagious?" he asked anxiously.

"They say not—it is infectious, but not contagious."

"Well, let's not worry," said Teddy resolutely. "And besides there is something else to give us immediate concern—for the safety of all of us."

"What is that?" asked Ralph, roused from his mood by the seriousness of Teddy's tone.

"I have just heard a radio call on the fifteen thousand meter wave."

"What!" exclaimed Ralph, jumping to his feet. "Then our friends are beginning to seek word from the expedition!"

"So it seems," agreed Teddy. "A call was repeated over and over, was followed by a period of waiting for reply, and then repeated."

"We must apprise the professor at once," said Ralph, with a return of his accustomed energy. "Let's go."

They hastened from the apartment, only stopping long enough to obtain a report on Margaret's condition. The attending physician advised the excited Ralph that his patient's temperature had dropped a full degree and that she was resting nicely.

"Well, that's some relief," said Ralph, brightening, "but this other thing—we must check up on the professor immediately."

They hurried to the observatory, where they found the professor and Torvan bending over a large chart on which there was a maze of circles and lines, and calculations in extremely small figures that covered great portions of the sheet. As they entered, the professor looked at them with beaming countenance. Gone was his pinched and haggard look of the past weeks and in its place there shone the flush of victory.

"Eureka!" he exclaimed.

"What?" said Ralph. "Did you find it?"

"We did," said the professor. "Look!"

He pointed to a circle amongst the other circles and ellipses on the chart. "This," he said, "is the orbit of the satellite Kellos. We have just decided on the name. We have calculated and plotted its orbit and position to a certainty."

"Are you sure?" asked Ralph.

"Absolutely. It was a stupendous task, but we have succeeded and are about to check our figures with the telescope."

"But if you can't see it?" objected Ralph.

"Not necessary to see it," said the professor shortly. "Come; Torvan was about to take me to the dome room. You may as well accompany us."

When the four had entered the lift which was to bear them to the location of the huge telescope of the Royal Observatory, the professor turned to Ralph in some excitement.

"Do you know," he said, "I have not even seen this optical instrument of Coris, so busy were we in our mathematical work. And I am very anxious to see how good it really is and on what principle it operates."

THEY soon emerged under a huge dome, reminiscent of the one over the great new reflector at Strathmore, but of still greater size. A shining metal tube, fully 20 feet in diameter and some 350 feet in length, was revealed to their gaze. This great instrument poised lightly on its equatorial mounting, which was incorporated in a huge metal pillar that extended down through the floor to unknown depths. So far, excepting for its great length, its appearance was quite similar to some of the instruments in use on the earth. The professor breathed hard as he looked at its gleaming mechanisms.

"Reflector or refractor?" he asked of Torvan.

"Refractor," said the Corisian scientist.

The professor positively laughed in his glee. "I knew it!" he exclaimed. "What is the diameter of the objective?"

"Seventeen tanes," answered Torvan, "or about 20 feet as you measure on Tinus."

"Two hundred and forty inches," breathed the professor, ecstatically. His faith in the refracting type of instrument was justified and this gave him more happiness than he had known in many a year.

"How did you construct a perfect objective of so great a size?" he asked.

"From a natural crystal taken from a mine near the city of Rankin," replied Torvan. "This crystal is optically perfect and does not exclude any of the rays of the spectrum. Many years were required to grind and polish the lens to its present perfection, but it is as nearly perfect as we know how to make it."

"But the tremendous magnification—you mentioned something like a hundred million diameters—how can this be utilized without interference from atmospheric disturbances?"

"We have no atmosphere to penetrate with our glasses," was Torvan's astonishing reply. "Do you observe the large ring at the upper end of the tube?"

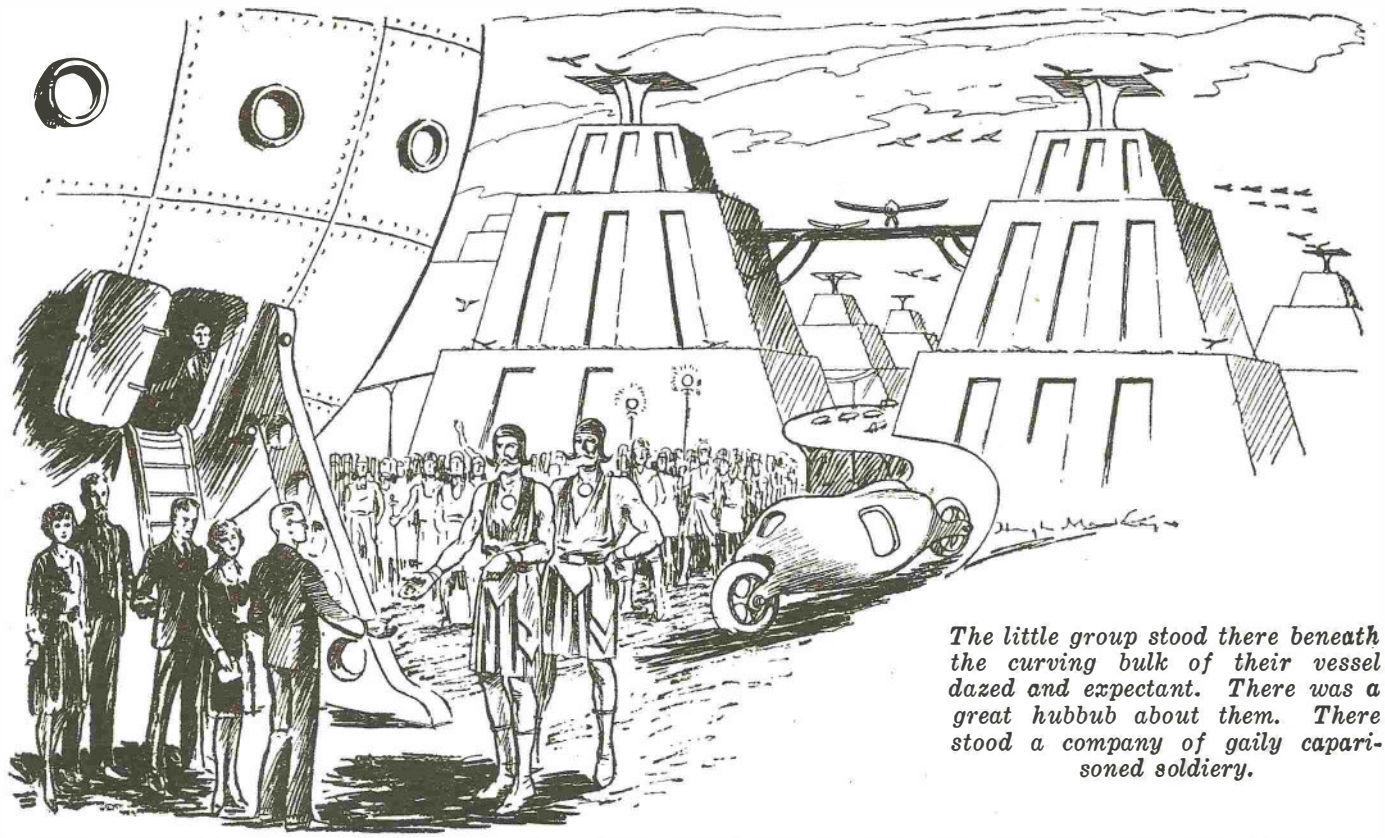
They observed what had passed their notice previously—a great ring of metallic tubing extending completely around the upper circumference of the tube.

"What is its purpose?" asked the professor.

"From that ring," answered Torvan, "there is projected a hollow cylinder of high frequency vibrations which extends completely through and out of our atmosphere. These vibrations are of such nature that a vacuum is formed within the cylinder and we have an entirely unobstructed view of interstellar space. Consequently we can utilize even greater magnifications than you mentioned without fear of interference, and the light collected by our objective is as great as that gathered by one of four times its diameter with the atmosphere intervening."

"Wonderful!" commented the professor. "But we must proceed with the checking of our figures."

"Yes," said Ralph, "there is no time to lose. I should have told you, Professor, that Teddy heard the Kellon-



The little group stood there beneath the curving bulk of their vessel dazed and expectant. There was a great hubbub about them. There stood a company of gaily caparisoned soldiery.

ians calling for their late lamented comrades by radio. That means we can expect another visit at almost any time."

The professor pursed his lips. "We must hurry," he said, spreading a sheaf of calculations before Torvan.

Glancing at some of the minute figures, Torvan stepped to the controls of the telescope, and by merely pressing a button, swung the heavy tube about the polar axis until a figure in degrees and seconds was indicated on a large dial at the top of the pedestal. Another button was pressed and the great instrument swung around quickly to the north, where it was carefully adjusted to a definite figure on another dial.

The professor checked these figures with the calculations, then glanced at the chronometer. "Unless we made an error," he said, "the satellite Kellos should pass this point in four minutes and twelve seconds."

"But you will be unable to see it," Ralph again objected.

"True," the professor agreed, "but we do not need to see it. The telescope is now trained on a definite portion of space and a certain star field is in view. When Kellos crosses this field the stars will be blotted from view and we shall have our required check. We have already determined the orbit, the mass, and the velocity of this body. All that remains is to check our figures and to determine its approximate diameter."

"How can you know its diameter?" asked Ralph.

"By the length of time consumed in passing the point at which our instrument is directed. We know the distance of the satellite, which is one million two hundred thousand miles at this point in the orbit. We know its velocity. Therefore the determination of its diameter is a matter of simple arithmetic."

He stepped to the eye-piece of the telescope and exclaimed anew at the proficiency of the instrument.

"This is remarkable, Torvan, remarkable," he said. "I have never seen anything to approach it. And some time—after our serious work is finished—I should like to play with this giant, and see for myself the conditions on some of the far-away worlds."

"That you may do," agreed Torvan. "Only seven seconds remain now." He passed the key of the chronograph into the professor's hand. "You make the observation, professor," he continued.

All waited breathlessly as the second hand of the clock neared the appointed time. Then—and it seemed an age—not two seconds later than calculated, the professor pressed the key and the chronograph recorded the time of the blotting out of the star field. Another period of waiting and the key was again pressed. The professor shouted his satisfaction as he left the eye-piece and joined Torvan at the chronograph, where he was determining the elapsed time between notches indented in the inked line by the pressing of the key.

He and the professor bent over their calculations once more, heedless of the presence of Ralph and Teddy. After a few minutes of rapid figuring, the professor exclaimed triumphantly:

"Now we have it all," he said joyfully. "Our figures were almost exactly correct. Kellos is just under two thousand miles in diameter. Its surface gravity is almost exactly two-tenths of that on Coris. Our original surmises, therefore, were not far wrong. We can leave for Kellos whenever necessary and plot a direct course to the satellite without trouble."

Torvan, too, was jubilant and Ralph and Teddy could scarcely contain themselves as they hurried to the palace to make preparation.

On their way to the council chamber Ralph and Teddy stopped at Margaret's door. Here they were greeted by a nurse who informed Ralph that the patient's condition had improved slightly.

"May I see her?" he asked.

"Indeed not," replied the nurse. "The doctor's orders, you know. I'm sorry."

Teddy spoke up at this. "Is Mary with her?" he asked.

"She is," said the nurse. "Do you wish to see her?"

"If I may."

The nurse disappeared within, and Mary soon came out. She greeted Teddy with affection and immediately consoled Ralph with further news of the patient.

"Margaret is much improved," she said, "but she is still a very sick girl. She has asked for you, Ralph,

but the doctors will not consent to her seeing you on account of the excitement it would cause. I think it foolish myself, but this is a disease with which they are familiar and undoubtedly they know best."

Ralph appeared so crestfallen that both Mary and Teddy had a good laugh at his expense.

"Don't worry now," continued Mary, "she is coming through all right, and I intend to watch over her every minute."

"We are leaving in the Comet to-night," said Teddy.

Mary paled. "For—for?" she said.

"For Kellos, the newly discovered home of the Kellonians," Teddy replied.

"But—but," said Mary, "I can't leave Margaret."

"So much the better," said Teddy. "I should much prefer that you remain here anyway. And Margaret will need you."

"And you?" asked Mary. "Suppose something happens to you?"

Teddy grinned. "Nothing is going to happen—except what happens to the Kellonians. But you mustn't think of that."

Mary raised a tear-streaked countenance and smiled bravely. "Good-bye," she said, giving Teddy a gentle push, "and I'll tell Margaret when she is in a condition to receive the news."

Still weeping, she rushed within, closing the door softly behind her. Ralph and Teddy started arm in arm down the long hall to the council chamber.

SOME two hours later the square before the palace was once more crowded with Corisians. All preparations for the expedition were complete and the Comet was ready to take off. Thalia had insisted that ten of her own bodyguard, armed with their own weapons, accompany the Tinusians and these had been assigned to quarters on board. In addition to the earth visitors, excluding the two girls, there were Romos, Valdor, Torvan, and Soltur, thus providing a company of twenty in all.

The radio still gave forth the almost continuous calls from the satellite for which they were heading.

Ralph, though still greatly concerned over Margaret's illness, was anxious to be gone and had little patience with the celebration that was in progress about the vessel. When the entrance manhole was closed, he rushed to the control room where he found Teddy already at his post.

"What do you say, Ted?" he said.

"Let's go!" sang out his friend. Suiting action to the words he pulled the control levers and the Comet rose majestically from her berth and was once more headed into the vastness of space.

Within a very few minutes the lights of Seritanis were lost to view and the direction of the Comet was altered to meet the instructions of the professor, who referred constantly to his calculations and diagrams. The rising whine of the machinery continued until a speed of two hundred miles a second was attained.

"I believe this is enough speed," said Teddy. "We shall reach Kellos in about an hour and a half at this rate."

"Good enough," said Ralph. "The captain and Soltur are still at work mounting the second of the energy projectors in the upper compartment and we should at least give them time to complete their work. Meanwhile I am going to listen over the radio once more and see if our friends are still searching for their lost expedition."

The professor followed him to the radio room where they again heard the unintelligible calls from Kellos.

"You know," the professor remarked, when they had satisfied themselves on this point, "these Corisians are a puzzle to me. In some ways they are far ahead of us in intelligence and learning, but in others their minds are like children. Take Torvan, for instance, the greatest of their astronomers. With all the improvement over the optical instruments used on earth, and the more intimate knowledge thus obtained of surface conditions on celestial bodies, his mind is still at sea on certain branches of astronomical science. To me it was a comparatively simple matter to determine the whereabouts of this satellite, but to him it was a considerable mystery, how we even suspected its existence. Then there is the question of their passive acceptance of conditions as they have been. By this I mean their failure to develop means of combatting the enemy more effectively than they have. With the resources of this planet at their disposal, they could have done far more had they persisted. There is something about their mentality, brilliant as they are along many lines, which is a mystery to me. There is a certain slowness, a certain hopeless attitude, which it is difficult to reconcile with their extreme need for clear and constructive thinking."

"Perhaps," said Ralph, gently, "their minds have been stupefied and slowed down by continuous disaster. Or, perhaps, these Kellonians released some poisons or energies among them on their many visits, which gradually effected a slowing down of mind, as you suggest. I am inclined to feel charitable toward them, Professor, though I must confess I have, on several occasions, had thoughts similar to yours. It is mainly a lack of spirit, of aggressiveness, as I see it."

"That's it exactly," said the professor, "but I suppose we should not criticize. We are here to help them and after they are freed from the menace they will no doubt develop into an entirely different people. In any event, they have done things we have not been able to do on earth, and our world is going to benefit considerably from the knowledge we will carry back with us."

"I should say so," said Ralph, "but we must remember that some of their accomplishments are attributable to their abundance of materials that are scarce on our earth, just as some of their failures must be attributed to a like reason, reversed. At any rate, we must forget comparisons now. Let us return to the control room."

THEY found most of the company assembled there, many of the Corisians being stationed at the windows and ports, admiring the beauties of the universe into which they were speeding.

The journey was more than half over when the captain and Soltur returned from their labors above.

"All set," reported the captain.

"Very good," said Ralph. "How much of the high explosive did you say we now have aboard?"

"Nearly twelve thousand pounds," replied the captain. "Enough to blow this entire satellite into Kingdom Come if it could be properly applied."

"Is it as powerful as all that?" asked Ralph.

"Absolutely," said the captain, "and woe unto the Comet if an accident happens in the magazines."

"Have you any plan of action, Ralph?" asked the professor.

"None," was the reply. "It is my idea to travel over the surface of the satellite for a time after we arrive, to locate the pit into which the galdon was dropped in our dream visit with the prisoner back on Coris. Something may develop then, but if it does not, we shall have to venture into the pit and carry the war directly to the enemy's stronghold."

"Quite an undertaking," remarked the professor.

"It is," said Ralph, "but that is what we are here for."

The Comet was now slowing down and the journey was nearly over. The members of the queen's guard became much excited as their destination was neared and they gave vent to their feelings against the Kellonians in no

uncertain terms. Their anticipation of the battle to come permeated the air with courage and determination, and when they were advised that only a very few minutes of the journey remained, their lust for the contest became so intense that they cheered and sang.

Ralph grinned at the professor. "Well, Professor," he said, "we can't criticize these Corisians on the matter of courage, anyway."

The professor smiled his approval.

CHAPTER XVI

The Dark Satellite

THERE was still no sign of the satellite toward which they were heading but all of the Comet's occupants waited breathlessly as the speed decreased until it was only ten miles a second. Then, when all eyes were glued to the windows of the control room, Ralph turned quietly to the professor and pointed in a direction slightly to the left of their line of course.

"Do you make out anything here?" he asked.

The professor looked eagerly at the spot pointed out and shouted, "It's there! Look!"

Before them, blotting the light from a small portion of an extremely brilliant star cluster, was a black disc which grew rapidly larger as they watched. Soon it filled the entire sky, and Teddy had slowed the Comet to a small fraction of her previous speed. Nearer and nearer loomed the blackness ahead and the altimeter began registering. Soon the needle pointed to an elevation corresponding to our ten thousand feet and Teddy brought the ship to a stop as all eyes strained in the darkness for a view of the surface of the satellite.

"Teddy," said the professor, "how is your altimeter operated? Not by atmospheric pressure, is it?"

"No, indeed," said Teddy. "It is operated by the actual gravitational attraction of the body we are nearing."

"Then we must be very much nearer than the indication," said the professor, "if the gravity of Kellos is only two-tenths that of Coris."

"Correct," said Teddy. "That is why we stopped. We must be no more than two thousand feet above the surface."

As their eyes became more accustomed to the blackness, a vague suggestion of the bristling surface became visible. The Comet dropped still lower, and the faint outlines suddenly loomed close. They were on the side opposite the sun, and it was almost impossible to discern more than a hazy suggestion of a dense forest of black spires in close formation. And they were not more than fifteen hundred feet above the tallest of these.

"Suppose we travel around to a portion of the surface on which the sun shines," suggested the professor.

Teddy complied, rising to a higher altitude and speeding the Comet westward. Not many minutes passed before the horizon could be seen—a black line from which leaped the first visible flames of the sun. Soon a magnificent sight met their view. The sun was rising on the dark satellite.

Slowly the great flaming orb came into view above the horizon, the prominences of the glorious vision leaping far into space, as seen on earth only during a complete eclipse by the moon.

"Our determinations were correct," breathed the professor. "Kellos has no atmosphere."

All were held spellbound by the blinding beauty of the rising sun. Though they had seen it many times from outer space in all the glory of its naked brilliance, unobstructed by an intervening atmosphere, it had been nothing like this. Now it seemed many times its normal size—by comparison with the jagged horizon ahead. Soon the tremendous ball was in full view and not until then did the watchers express their amazement.

"Lord!" said Steve, with a quick intake of his breath, "what a sight! That alone is worth the whole trip."

"It surely is," said Ralph, "and see! The horizon can now be made out quite clearly."

It was true. The sun rose higher and higher as they sped westward and was soon invisible from the control room windows. But now the surface beneath could be made out quite clearly. The blackness of its desolation had no comparison. Torn and broken was its surface, the spire-like formations in endless confusion being broken only occasionally by deep twisting fissures which were black as the bottomless pit, showing as great scars, even against the ebon of the surface. No sign of life or of color was discerned after an hour of travel. Occasionally the Comet passed over the bed of an extinct ocean or lake, but these spaces showed a very similar formation to the surface, the only indication of water having been present at some far distant age being the eroded and blunted appearance of the spires which dotted the depressed surfaces.

"I can't see," remarked Ralph, "how any creatures of as great size as the Kellonians were ever able to inhabit the surface. Why, they should hardly find it possible to squeeze between the prominences."

THE professor laughed. "My boy," he said, "the Kellonians are no doubt the result of eons of evolution in their underground domain. The original dwellers on the surface might well have been of no more than the size of our house cats at home. In fact that is what one would naturally suppose, and creatures of such small size would find plenty of space, though I should say they must have been mountain climbers. Then, too, there may have been widespread changes in the character of the surface since life deserted it. These spires might have been forced up by internal convulsions, though the appearance of those in what seem to have been ocean beds, would indicate that they existed for some considerable period before the waters were dried up. It is still a great mystery, but here we have it before our eyes."

"Another puzzling thing to me," said Ralph, "is why, even though Kellos reflects practically no light, the disc of blackness has not been observed before. Surely, with the powerful telescopes of Coris, it must have been observable as we have seen it, blotting out the light of the heavens, which it obscures when passing across the field of vision."

"It would have been possible," replied the professor, "but you must remember that only today has its location been determined and that, so great is the magnitude of space, that a chance passage of the satellite across the field of a telescope might not occur once in a million years. Its relative size in this vast universe of ours is infinitesimal when viewed from Coris, over a million miles away. No, the chances of its being observed, without knowing where to look for its were mighty small."

"Now that we are here," interjected the captain drily, "what are we going to do about it?"

Ralph stared. "Why," he said, "we must first find an entrance to the interior."

"That may be some task," said Teddy, "especially if there is only one. We might cruise over the surface for months without locating it."

"By George, that's right," said Ralph soberly. Then he thought of the radio and was up the steps, three at a time.

Steve and the captain followed him and watched in silence as he adjusted the headphones and listened intently. Soon he smiled and handed the phones to Steve.

"They're still trying to locate the lost expedition," he grinned, "and now, let's get the direction-finder working."

"That was a happy thought," said the captain, "but where is it?"

Ralph looked at him blankly. There was no sign of a loop antenna in the radio room. "Go down and ask Teddy," he said.

The captain complied and soon returned with the news that all the antennae for the radio were located outside the hull of the Comet, as it was necessary to have them outside the insulating metal. But Teddy had told him where to look for the dial of the direction-finder, and they were soon making observations of its indications as Ralph carefully noted the increase and decrease of the signal strength with its rotation.

With their news given to Teddy the Comet soon changed its course and headed in a northeasterly direction at reduced speed. All hands manned the floor ports of the control room, scanning the desolate blackness below for signs of some sort of a radio antenna system. For several hours they proceeded thus, the Comet traveling at five hundred miles an hour and about six thousand feet above the broken surface.

"Maybe their aerial is underground," said Steve.

"Possibly," said the professor, "but this is worth trying, and it may lead us to the entrance to their domain."

Ralph returned to the radio room occasionally and reported the signals increasing greatly in intensity. Soon they had become so powerful he found it necessary to detune to prevent paralyzing of the detector tube.

"Better slow down, Teddy," he said, after his last visit to the radio. "I think we are getting very warm right now."

The Comet proceeded at snail's pace, and one of the Corisian guards soon reported a glint of light on the surface about a mile to the right of their course. Teddy swung the vessel about and headed in the direction indicated and in a few minutes they made out the outlines of a metallic tower rising from between two of the black surface spires. As they neared this they found it to be much brighter than the dull ebon surroundings. It was about the color of oxidized copper and was a circular structure some two hundred feet high and thirty feet in diameter, surmounted by a conical roof of the same material. The Comet was maneuvered to a position about five hundred feet above this object.

RALPH rushed once more to the radio and returned with the announcement that the signal intensity was so great that sparks were chasing through the receiver with audible crackles.

"That's where the transmitter is," stated the professor; "or at least the antenna. But where is the entrance shaft?"

The yawning pit of the Kellonian's dream was not in sight.

"Let's blow this darn thing up anyway," said Steve.

"Good idea," agreed Ralph, and the captain procured one of the hand bombs.

The professor only smiled.

The captain knelt at one of the floor ports and unfastened the latches around its edge. He grasped the handle set into its metal rim and heaved mightily, but the port would not open.

"Something wrong with it," he said.

The professor laughed. "Captain," he said, "you are trying to lift nearly ten tons. That port is over twelve hundred square inches in area. Outside there is a complete vacuum so there is about fifteen pounds pressure on every square inch of those more than twelve hundred. Figure it out for yourself. And, even if you did succeed in opening it, I am afraid we should have some difficulty in breathing before you could close it. Our air would pour out of that opening very rapidly."

The captain looked crestfallen. "Then of what use are our high explosives here?" he asked.

"Never mind, Captain," said Ralph, "we'll find good use for them yet. Why not try the energy projector on this radio tower?"

"But," objected the captain, "if it operates by transmitting power over a beam of ionized air and if there is no air surrounding us, it will not work either."

"Try it anyhow," suggested the professor.

Permanent connections had been established with the main generators and it was a matter of only a few seconds for the captain to direct the energy and pull the switch. Everyone watched the metal tower below. For a moment nothing happened. Then, slowly the top of the structure changed color. Soon it was cherry red, then white, and with a slow shrinking movement it collapsed into a molten pile spreading snakily amongst the bases of the surrounding spires.

"Ha!" exclaimed the professor, "I thought so. Your machine transmits its power through the ether, independently of an atmosphere. And this may prove very fortunate here."

Ralph had vanished but soon returned with a smile of triumph on his handsome face. "No more radio!" he exulted. "Wonder what they think down below. The ether is as silent as a tomb."

"They may think plenty," said Teddy, "and maybe they'll come out to investigate. Suppose we retire to a greater altitude and watch."

"Fine business," said Ralph.

The Comet was raised until the now shining mass, which had been the tower, was just barely visible and there she took her position, some fifteen thousand feet above as nearly as could be estimated from the higher altimeter reading.

Nearly an hour passed. Then one of the Corisians gave vent to a startled exclamation. A galdon was approaching from the east.

Its bright metallic sides gleamed like a living thing against the blackness, for the sun was almost directly overhead. Slowly the Kellonian vessel approached the spot where lay the ruins of the radio tower. Slowly it circled about, then headed back in the direction from which it had approached.

"Funny they didn't see us," said Steve, as Teddy prepared to follow the leisurely moving galdon.

"They could not see us," said the professor, "for our dark surface is facing them. We cast no shadow in that blackness beneath and the only possible way they could become aware of our presence would be from an increased altitude sufficiently high to enable them to see our brightly lighted upper hemisphere. That is, unless we should happen to be directly in their line of vision to the sun, in which case the shutting off of its view would indicate an intervening object."

"Shall we destroy the galdon?" asked the captain eagerly.

"No," replied Ralph, "we'll follow and locate the entrance to their own private little hell."

FOR about twenty minutes the Comet trailed the galdon, keeping as nearly directly above them as possible. Then they saw the pit which had appeared in the captured Kellonian's dream. Its deeper blackness showed as a vague blot on the surface and Teddy dropped the Comet to obtain a closer view. As the galdon approached the great opening, which must have been of more than a thousand feet in diameter, two shining rails rose from its depths and stopped at the surface. Gently the galdon lowered to a landing on these rails and immediately it dropped from sight.

"Some elevator!" exclaimed Steve. For the galdon was as large as one of the great air liners of Coris or Tinus.

"What shall we do?" asked Teddy.

"Follow them," ordered Ralph excitedly.

Obediently Teddy dropped the Comet into the immense

shaft, knowing that it would be as dark as a dungeon when they were within. Cautiously he advanced the control until they were dropping with considerable velocity. He watched the instruments intently to be certain they were dropping vertically. Then—the Comet bumped heavily on one side.

"Damn!" said Ralph. "Turn on our searchlights."

"But we'll be seen if we do," objected Teddy.

Just then the problem was solved by the enemy, for a faint glow appeared beneath them—so close that Teddy pulled the controls violently to slacken the speed of the Comet.

They had nearly collided with the galdon which was descending at a far slower pace than they were. But there were lights beneath the enemy vessel, either on the ship itself or on the supporting structure which bore it. And these lights shone downward, lighting the sides of the huge shaft for many hundreds of feet below the galdon. Teddy breathed a sigh of relief and suited the speed of the Comet to match that of the larger vessel below. Down, down they dropped for an interminable period. Still the instruments indicated no surrounding air pressure.

"Professor," remarked Teddy, "there's no atmosphere down here either."

"Naturally not," was the reply. "When the surface atmosphere disappeared, any air down here was drawn into the resulting vacuum and soon dissipated. At present they must have an artificial atmosphere."

"But what's to prevent its escape also?" asked Ralph.

"An air lock," was the professor's laconic reply. He was thinking deeply.

The shaft continued straight downward and at a depth of more than three hundred miles, as calculated by the professor, the galdon came to a stop with the Comet hovering close above.

"Incredible!" said the professor, "that this shaft and the elevating mechanism could have been constructed by these creatures. And if it was, where is the material that was removed? I am more inclined to the belief that it is a natural opening, though this seems equally impossible since it is of uniform diameter and as straight as a rifle bore. Another mystery! The elevator could not possibly be operated by a supporting member of three hundred miles length. Such a member would be as flexible as a string and would collapse of its own weight. And, why could not the galdon descend by its own power as we have done? Still another mystery."

He frowned in perplexity.

"Look!" said Ralph.

THE galdon was resting on a great circular platform and, as they watched, a broad rectangular panel slowly drew back, opening a great slit into the recess below. Through this opening the galdon was lowered to another circular platform some two hundred feet lower. Then the panel in the upper platform slowly returned to its place, leaving them in total darkness. Teddy turned on the control room lights and the group burst into excited conversation.

"Wait a minute. Wait a minute," said Ralph. "We are in a quandary now. Let's have a good look at the bottom of this well."

The searchlights were turned on the platform beneath them and revealed nothing but a smooth expanse of metal, broken only by the edges of the sliding panel. There was absolutely no opening through which an elevating shaft might have projected.

"Well, what do you think of that?" said Steve.

"That is our air lock," said the professor, "and there is no elevating and lowering mechanism. The rails on which the galdon landed must be merely some sort of guiding device, propelled by some power of its own, different from that of the galdon. Come to think of it, we never did see one of them rise or drop vertically. It must be they are constitutionally unable to do so, as were our old airplanes."

"What is the next move?" asked Teddy.

Ralph considered for a moment. Then he said, "Well, I guess we must retreat and think it over a bit. If we destroy this air lock the atmosphere underneath will undoubtedly escape, but we have no assurance then that all of the Kellonians will have been suffocated. They may have other air locks; may even have hundreds of them. The caverns below must be of huge size and extent and there may even be other means of ingress and egress. Suppose we return to the surface and keep watch at the entrance to this shaft."

Teddy pulled the switch which furnished the current to the powerful upper searchlights of the Comet. The wall of the circular pit then became visible in the periscope screen.

"Look!" exclaimed Teddy excitedly.

There, in the disc of the periscope, the pit above them was being slowly closed off by a sliding metallic partition which advanced inexorably from the side of the shaft about a hundred feet above the upper side of the Comet. In less time than it takes to tell, the opening was entirely blocked. They were trapped!

"Now, isn't that kind of them," said Ralph calmly. "We are not as smart as we thought. And the enemy is far smarter than we imagined."

Surprised exclamations broke from the group.

"How do you suppose they knew we were following?" asked Steve.

The professor grunted. "I might have known these creatures could see in the dark. Why, they have been living underground for ages and must have developed the cat-like faculty to a great degree. The size of their great circular eyes should have warned us."

"But what are we to do now?" said Ralph.

"I fear that is pretty much up to the enemy," replied the professor. "We might destroy this upper partition with the ray projector installed in the top compartment. But the descending molten metal might injure the Comet if we did this. Besides, we do not know how many other tricks these clever Kellonians may have hidden on the way out."

Ralph was angry now. "No!" he said. "We'll stick it out here now and see what happens. Captain French will man the energy projector here and watch the panel below. Steve will man the upper one and watch for hostile demonstrations from above. We'll fight them at their own game and I fancy we still have the advantage."

"Hooray!" shouted Steve as he started for the upper compartment. "Now you're talking."

Teddy extinguished the control room lights and switched on all of the external searchlights so that the compartment in which they were trapped was brilliantly illuminated in all directions. Numbers of the Corisian guards were despatched by Ralph to the side compartments of the vessel to watch for attacks from their own level. There was no certainty that many entrances to their prison did not exist.

"If they should approach us from above," suggested the professor, "the blue flame would almost certainly mean our end."

"No doubt of that," said Ralph, "but, somehow, I have a hunch the attack will be from below. When this shaft was arranged for entrance and exit, the enemy could not possibly have expected an attack in their own abode, so they would hardly have arranged an elaborate defense armament. It is more likely that the partition above us is merely a supplementary one to provide an additional air lock so that repairs can be made on those below."

This surmise proved later to be correct.

As time went on and nothing happened, the adventurers became impatient. Trapped three hundred miles below the surface of this forbidding globe, more than a million miles from Coris and many times that distance from the earth, they were as isolated from the rest of the universe as it is possible to imagine. Grave doubts as to the ultimate success of the venture came to many of the party, but Ralph and Teddy refused to be discouraged. Doctor DePolac wiped his brow and brought his hand away dripping with perspiration.

"Isn't it getting hot in here?" he asked.

Teddy glanced at the thermometer. "Lord, yes," he said. "It's 98 degrees now. Wonder what's wrong with the refrigerating apparatus?"

But the refrigerating apparatus was functioning perfectly. It was automatically controlled to maintain a temperature of seventy degrees at all times and a visit to the machine room showed that the motors were operating at full speed and the apparatus taxed to its utmost. A glance at the platform below showed evidence of a change in its color and Teddy switched off all lights at once. A dull red glow suffused the surrounding pit, the cherry-red radiance of the platform beneath them streaming through the windows and ports of the control room, lighting it with the dull glow of a photographic dark room.

"Trying to roast us out, are they?" shouted Ralph. "Well, two can play at that game. Give 'em the works, Captain!"

The control room was suffocatingly hot by this time and the perspiration trickled down the captain's face in streams as he pulled the switch of the ray projector and directed its energy on the platform below.

With the partition already heated to a considerable temperature it was not long before the energy took effect and the metal platform sagged and broke. A great opening appeared in the center, widening rapidly and dripping molten metal in huge blobs to the second partition beneath. Soon the opening was large enough to admit the Comet and Teddy dropped her into the lower chamber. The energy played over the surface of the lower platform and it too gave way and opened up the cavern beneath. As the opening broke through, the metal burst into sizzling, white-hot sparks burning like magnesium. The illumination far outshone the searchlights of the Comet and blinded the observers with its glare.

"Air! Air!" shouted the professor. "We have released the air from the lower caverns. But it cannot escape past the third partition."

The temperature was already becoming lower in the control room and Ralph ordered the captain to turn off the energy when he saw that the second opening was large enough for the Comet's entrance. Below them spread a huge cavern, the cavern of the captive Kellonian's dream, and in it there reposed three of the galdons with their towers already projecting from the upper surfaces. As the air cleared, one of the towers burst into its familiar orange tuft of flame, then the second and third.

Ralph laughed. "Now we've got you," he said.

CHAPTER XVII

Exploration

THE cavern of the galdons was a tremendous circular one with arched roof, fully three thousand feet in height and about one mile in diameter. The three galdons hovered close to the floor of the cavern as the Comet remained at the opening, which had been fused through the partition at the top of the arched roof.

"Keep your position," said Ralph to Teddy, "so the enemy cannot rise above us and get his blue flame into action. We may have other things to contend with."

All three of the enemy vessels increased the power which produced the orange tufts at the tips of their towers until these spread into great flaming balls of a hundred feet diameter. But there was no effect on the occupants of the Comet.

"Get the one on the right," Ralph ordered the captain, "and we'll see what happens."

The energy of the projector was directed on the hull of the galdon indicated by Ralph, and the pyrotechnics started at once. Soon the first ship was reduced to a sputtering, dazzling mass of molten, burning metal, the cavern being illuminated to blue-white intensity in the process. Abruptly the orange tufts vanished from the towers of the remaining vessels and they arose from their positions to approach the Comet. As they did so, there came the clouds of purple vapor which had been used by the raiders of Coris. At once the cavern was completely filled with the dense fumes and it was impossible to see from the windows of the control room.

"Retreat through the opening," ordered Ralph.

Teddy complied by raising the Comet a hundred feet, when they knew they were within the first compartment of the air lock and could not be followed by one of the galdons on account of the size of the opening through which the smaller vessel had entered. The captain now played the energy beam from his projector in a circle beneath them, hoping accidentally to come in contact with the hulls of the Kellonian vessels. After several minutes of this, with no abatement of the purple vapors, a bright flash like that of an explosion told of the energy having found its mark on one of the galdons. Another flash, and still another, told of further successes and soon the purple vapors began to recede. A vent had evidently been opened in the cavern wall and the vapor was being allowed to escape.

Ralph exulted. "Their gas did them as much harm as it did us," he gloated, "more in fact. It only blinded us, whereas if the energy melted an opening into the hull of one of their vessels, the occupants would be asphyxiated by their own gas."

The air was soon clear and Teddy dropped the Comet to the opening in the roof of the cavern. One of the galdons had fallen to the floor and was turned on its side, a gaping hole appearing near the stern. Not a sign of life was visible.

"Good work, Captain," said Ralph. "You got that one. But watch the other now!"

As he spoke the last words, there came a flash of flame from the second galdon and a stream of blinding light played over the lower surface of the Comet. A port cover under their feet cracked with a snap like that of a whip. Another followed and the temperature of the control room rose suddenly to unbelievable heights. One of the Corisians fell to the floor, overcome, and Captain French slumped over his beloved projector in a grotesque heap. Teddy stuck to the controls and Ralph was barely able to reach the magazine and obtain one of the powerful hand grenades just as the crystal broke completely out of one of the ports and fell into the depths of the cavern.

"When I throw this," gasped Ralph, crawling painfully to the now open port, "shoot the Comet into the chamber above."

He tossed the bomb directly along the line of the beam of flame and Teddy pulled the lever which sent the Comet into the chamber overhead. There was a terrific detonation below and the Comet rocked and tossed violently, bumping the upper partition heavily as it missed the opening into the second chamber. Then all was still. Teddy had fallen over the control levers and every other occupant of the control room was unconscious. The odor of singed clothing and hot metal permeated the air.

Ralph was first to recover and he nursed a badly burned right hand as he looked dazedly about him.

"Wow!" he said, "that was close."

He staggered to his feet and looked through the open port. Nothing could be seen through the opening in the lower partition with the exception of the settling cloud of dust and particles of material shattered by the explosion. Teddy was stirring and Ralph lifted him to an upright position, his head hanging loosely on his breast.

"Are you all right, old man?" asked Ralph anxiously.

Teddy recovered with a start. "Yes—yes," he said weakly, "all right, Ralph. Just knocked out for a minute, that's all."

His hands were blistered from contact with the suddenly heated control levers, but he was otherwise unharmed.

"Wonder how hot it was in here?" said Ralph.

"The last I remember of the thermometer it was more than two hundred Fahrenheit," answered Teddy. "We were nearly boiling then, and the metals must have been very much hotter."

"Whew!" said Ralph, "I never want to be where it's any warmer. Suppose we drop a bit and see what it looks like down there."

The Comet was dropped into the cavern, and by this time most of the rest of the party had recovered from the experience excepting for a few flesh burns which, though painful, were not dangerously severe.

The scene in the cavern was well nigh indescribable. Where it had formerly presented an orderly, smooth-walled and symmetrical appearance it was now a shambles. The floor was no longer a floor but a mass of piled up and broken rock and debris fully a hundred feet deep in places. Great jagged masses of rock had been torn loose from the walls and the arched roof, and these had broken up when falling to join the wreckage below. The galdons had vanished beneath the debris. The normal lighting of the cavern was gone, the only illumination now being from the lights of the Comet, and this was reflected in many hues of glittering color. The interior of the dark satellite presented a welcome contrast to the exterior in this respect.

The captain moved to one of the open ports and breathed his relief at the sight. "What happened?" he asked.

"One of your wonderful hand grenades did the work, old man," said Ralph, "and I guess we are safe for the time being."

The air in the control room was breathable, though all of the occupants found their breath coming a bit short at the least exertion. The professor consulted the barometer and found that it registered but nineteen inches.

"Evidently," he said, "they are accustomed to a more rarefied atmosphere than we. But we can stand it all right. This is no worse than at twelve thousand feet elevation on our own earth."

"The next move," said Ralph, "is to reconnoiter. We'll land in that mess down below and look around a bit."

Steve was all excitement as Teddy maneuvered the Comet to a resting place in the heap of wreckage. "Can I go, Ralph?" he asked anxiously.

"Yes, Steve, you may," replied Ralph, "and I want Captain French and four of the Corisian guards with me. Teddy and the rest will remain aboard the Comet."

Four of the Corisian guards were chosen and they prepared to follow Ralph, in company with Steve and the captain. Each was armed with a cathode ray projector and an electric torch and, one by one, they stepped gingerly from the entrance manhole of the Comet.

THE sensation, as they stepped from the normal gravity region of the Comet to the rocks below, where gravity was only one-fifth of that to which they had been accustomed, was extremely novel. They seemed to float and wabble uncertainly at every step. One of the guards attempted a leap and it carried him fifty feet, bruising him painfully as he slipped between two jagged stones. The exertion set him gasping for air and he grew purple in the face from the effect of his incautious move. The normal respiration of all members of the party had increased more than a third due to the lack of sufficient oxygen in the air of this sub-surface realm and, while their exertions produced tremendous effect in the way of covering distance at a step or bound, it was necessary to shuffle along at a comparatively slow rate, not only to maintain equilibrium, but to prevent overtaxing of the lungs and heart. In addition to the low barometric pressure and scarcity of oxygen, it appeared that certain elements of this air were deleterious to the lungs of the visitors and liable to cause trouble. They found great difficulty in breathing and soon experienced an oppressed and suffocating sensation that caused Ralph no little alarm.

"Be careful now, boys," he warned. "The footing is very treacherous and I don't want any of you to get hurt climbing around these sharp-cornered rocks."

The searchlights of the Comet illuminated the entire cavern so they did not find it necessary to use their torches. But it was with considerable difficulty that they made their way across the heaps of rocks to the nearest wall of the cavern. When they reached it, they found the going somewhat easier, for most of the debris had fallen away from the walls, and a comparatively smooth area was encountered around the edge. After progressing about one-quarter of the way around the huge chamber, they came upon a cleft in the wall, which had the appearance of a much-used passageway. Ralph pressed the button of his torch and flashed its rays down the passage. Nothing could be seen but a straight, low-ceilinged tunnel, which had obviously been hewn from the solid rock. Its sides were smooth, as was the floor, though the roof was more or less broken up and roughly hewn.

All torches were placed in service and the little party from the Comet proceeded cautiously along the passageway that led into the realm of the Kellonians. Where it would take them they did not know, but they were determined to know more of the loathsome enemy, and of the nature and extent of his habitation.

The passage became narrower as they advanced and soon took a winding, tortuous course that led ever downward. There was not a sign of life or of communicating passages for more than two miles. The temperature was moderate, though the humidity was high, and this, coupled with the rarefied and putrid air, made overexertion out of the question. When they had walked a half mile further, Ralph suddenly halted the party.

"Hush," he said. "I hear sounds ahead."

All strained their ears and soon agreed that a low humming sound came from somewhere not far before them. It sounded like the drone of high speed machinery. They advanced still a little further and the sound became more distinct. Soon it was quite loud.

"Lights out," ordered Ralph and they proceeded quietly in the darkness.

At the next turn of the passage the not unmusical sound smote their ears in full intensity and they became aware of a dim light in the passage just ahead.

"Quiet now," whispered Ralph and complete silence was maintained as the party crept forward inch by inch toward the sound and the light.

Ralph was in the lead and he approached the end of the passage very carefully, motioning the others to remain behind. A few feet further and he found himself on a gallery surrounding a cavern of still greater size than the cavern of the galdons. The cavern was lighted with moderate brightness and the sight that met Ralph's eyes was one of the strangest he had ever seen. The gallery was

high above the floor of the cavern and its rail formed ample protection from the view of those below. He motioned for the rest of the party to follow and they were soon lined along the rail of the gallery gazing on the scene in the pit, but keeping well in the shadow to escape detection.

In four lines, lengthwise of the rectangular chamber, were hundreds of huge retorts, their shining spheres tapering to an equal number of tubes which led to immense ducts installed along the sides of the cavern and disappearing through the rock walls at either end. At the center of the chamber a huge blower was installed in each of the four main ducts and it was the whirr of these blowers which produced the sound that had assailed their ears and given the first warning of their approach to the cavern.

"Part of their ventilating system," whispered the captain. "Oxygen apparatus probably. What a wreck one of our bombs would make here, though we should probably suffocate along with the enemy if we destroyed it."

"Yes," breathed Ralph, "and look at the Kellonian in charge."

ON a central platform there reposed one of the ugliest and largest of the intelligent but detestable creatures they had yet seen. His bulbous body, covered with horny protuberances, palpitated in a jelly-like mass, which reposed on the platform. The tapered tentacles dangled over the side, nervously twitching and writhing here and there, as the sensitive tips wandered over the floor. The great eyes stared fixedly at an arrangement of indicating instruments on a series of panels directly before the platform.

Steve pointed to the far side of the chamber. "Good God!" he said, almost too loudly, "look at that!"

Three naked Corisians had stepped through an opening in the far wall. The foremost of the three, as tall as any of his kind but emaciated and bent with labor, bore a huge sack of something on his shoulders. The other two, equally cadaverous, carried between them a container of liquid so heavy that they could scarcely stagger along under its weight.

One of the Corisian guards, incensed at the sight, arose to his full height and was about to shout forth his anger. Ralph clapped his hand over the guard's mouth and pulled him to the floor of the gallery and out of sight.

"Not now," he whispered. "Later comes your revenge. And perhaps we may be able to save some of your compatriots from their slavery here."

Realizing the necessity of silence, the Corisian guards held their anger in leash, and watched the proceedings below in silence.

The vat of liquid was placed before the loathsome Kellonian and the sack was opened. The two Corisian slaves who had carried the vat stepped back while the third inverted the sack over the vat and let its meal-like contents run into the liquid. Then he produced a paddle from beneath the platform and stirred the mass vigorously, the tentacles of his master writhing in anticipation the while. Then one of those fearsome appendages, thicker than the rest, stretched forth and its end was inserted in the batter. The level immediately lowered as the tentacle was withdrawn and carried to the gaping mouth of the creature, where it was inserted and its contents discharged. Several times this maneuver was repeated and the vat was empty. The disgusting monster fed itself as an elephant drinks water!

The watchers were startled by a booming voice, which suddenly issued from the throat of the Kellonian. Deep and thunderous it rolled across the intervening space, echoing and re-echoing through the huge cavern—evidently an order to the slaves.

Obediently the three Corisians, who had stood with bowed heads during the feeding of their master, picked up the empty container and the sack and started for the opening through which they had entered. When the opening was reached one of them, evidently goaded to desperation, turned, and straightening his shoulders, shouted a mighty Corisian curse back at his oppressor.

Then came another surprise to the watchers. When on the surface of Coris, the Kellonian is an unwieldy monster, barely able to drag himself about. But, in his own element, this one moved with the rapidity of lightning. In one bound he was across the chamber and, picking the unfortunate slave from the floor in one of his huge tentacles, raised him high in the air and dashed his brains out on the floor beneath. The two companions of the rebellious slave stood against the wall trembling with fear.

The guards on the gallery could restrain themselves no longer, and two of them arose and, with repetitions of the curse uttered by their unlucky compatriot, sent stream after stream of the deadly cathode rays from their projectors into the body of the Kellonian. The great ball of flesh that was his body and head literally melted and collapsed into nothingness before the fierce onslaught of the avengers. Then all was silent for a moment.

Astonished at what they had seen, the two remaining prisoners were stupefied for a moment. Then, slowly, they raised their eyes to the balcony from which this sudden destruction had come. They shouted their joy at what they saw—four of their own people, fully clothed and healthy and with three smaller but equally good to look at male beings. With a warning to the newcomers to hide and wait where they were, the slaves slipped through the opening and disappeared.

"Now we're in for it," said Ralph, "but I guess we are in no worse position than before, at that. They will soon know of the destruction of their galdons and will be on our trail then."

The guards who had killed the Kellonian apologized humbly for their rashness and disobedience of orders, but Ralph could not blame them for their actions and exonerated them at once.

AFTER a fifteen-minute wait they saw the two prisoners creeping carefully along the balcony in their direction. This was the first ray of hope these poor unfortunates had seen since being taken from their homes, and they were as excited as children when they reached Ralph and his party.

On Ralph's order the entire group retreated a short distance into the passage by which they had entered and there they stopped for conversation with the two rescued prisoners. Ralph stationed a guard about two hundred feet away in either direction to warn of the approach of danger. Then the questioning of the overjoyed slaves was begun.

By means of his acquired knowledge of their language and of the faculty of thought transference, which made so few words necessary in conversation, Ralph was able to question them and to receive their replies as intelligently as if they were conversing in his own language.

"What are your names?" was his first question.

These he found to be Kirn and Colet respectively.

"How many of your number are left here?" asked Ralph.

"Less than one hundred," answered Kirn sadly. "They never permit more than a thousand of us to live at one time, and, whenever the number becomes less than one hundred, another trip is made to Coris to replenish the supply."

"Where are your quarters?" was the next question.

"In the cavern of horror," replied Kirn with a shudder, "not more than three miles from here."

"Do all of the slaves dwell together?"

"Yes, male and female alike. Though there are none left but males. The females do not live long and it has been decreed by the Mogara that in the future all females shall be killed and only the males retained as slaves."

"Who is the Mogara?"

"The ruler of this infernal realm," answered Kirn. "He dwells in the great central cavern, twenty miles away. None of us has ever seen him and returned alive."

"How extensive is the kingdom of the Kellonians?" asked Ralph.

Colet answered this time. "I have worked with the cleaning squad and have had opportunity of examining the maps in the possession of the head of that department. These cover all of the passages and caverns, and are to scale. From them I deduced that the longest distance from one end to the other of the labyrinth of passages and caves is three hundred miles, and the greatest width one hundred."

"Are there other openings to the surface than the one through which the galdons leave and enter?"

"None," replied Colet.

"All of the chambers are interconnected?"

"Yes. But there are twelve main divisions, each with its own oxygen plant and separate ventilating system. These can be isolated, if necessary, by means of air-tight partitions which are automatically operated by failure of the air pressure at any particular point."

"What is the population?" asked Ralph, "How many Kellonians do you think inhabit this ungodly place?"

"Not more than a million, as far as we have been able to learn," replied Colet.

"Have they transportation and communication facilities?"

"Yes. There is one central tube extending the full length of the kingdom, and its cars, pneumatically propelled, are able to traverse the entire three hundred miles in little more than a half hour. Their communication system is very elaborate and includes all main divisions. It is electrical and like their etherphone, conveys the spoken voice rather than the thoughts."

"Then the failure of the latest expedition to Coris is known throughout the realm?" asked Ralph.

"It is," said Colet, "and it has brought consternation to the Kellonians. They have been unable to learn any more details since the second galdon reported the destruction of the first. They sent out a supporting expedition, and have been unable to communicate with these galdons either. And, only a short time ago the radio apparatus here was entirely put out of commission for some unknown reason."

Ralph grinned. "Well, that will be all for the present," he said kindly. "We'll return to our vessel and get you fellows dressed and fed up."

As they were about to advance down the passage, Kirn suggested that they return to the cavern of the galdons by another route to give the newcomers an opportunity of secretly visiting the council chamber of the division, which, he stated, was not far off and but very little out of the way. Ralph readily agreed and the party returned to the balcony of the oxygen plant. Silently they looked into its depths and were surprised to see that the slain operator already had been removed and a substitute put in his place. The body of the slave had vanished.

"We must hurry," palpitated Colet, "they will be after us immediately."

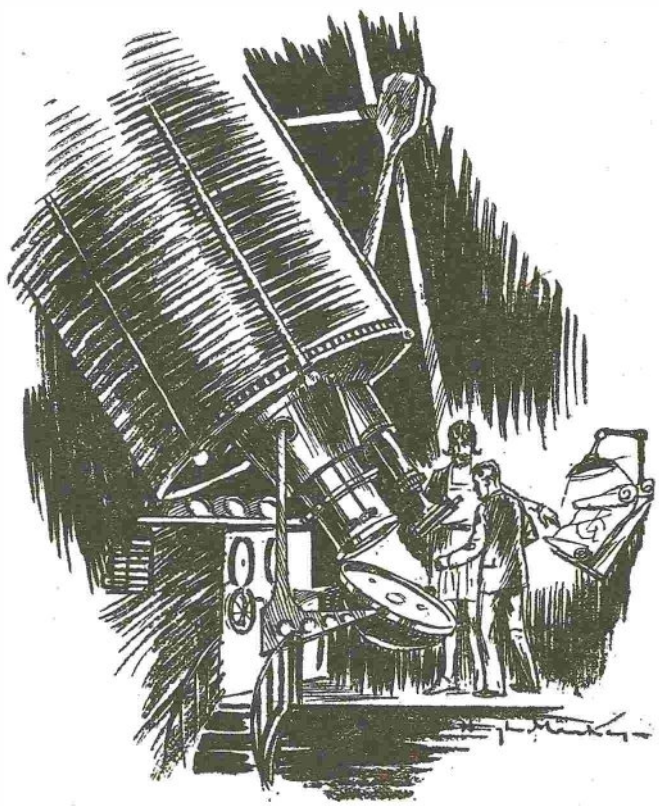
He led the way along the narrow balcony to another passage and the party ducked hastily into this with electric torches lighting the way and Kirn and Colet leading. After a walk of about a mile, Kirn halted them and told them the lights must be extinguished as the council chamber was very near. A confused babble could be discerned, which grew rapidly louder and more raucous as they advanced.

SOON they emerged on a narrow gallery similar to the one around the oxygen plant and, hiding behind the rail as well as they could, they looked down upon the strangest meeting they had ever witnessed. Fully twenty of the monstrous Kellonians were gathered on the floor of the cavern, which was much smaller than the two they had already seen. These creatures were in a state of great excitement and milled about and argued and shouted, with fury and fear in their unpleasant booming voices.

"They are discussing the arrival of your vessel and the destruction of the galdons," said Kirn. "From what I can gather, the news has spread throughout the realm and plans are being made to destroy you."

"That may prove difficult," said Ralph grimly.

At that moment a tentacle stretched from behind and the horrid thing suddenly wrapped itself about Steve's body and pulled him back toward the passage. A Kellonian had followed them unawares and as a second tentacle reached forth to grasp the captain, the voice of the creature boomed forth a warning to those below. Ralph turned and, though he could scarcely see the monster which had grasped Steve, poured the deadly energy of his ray projector into its body. With a horrible convulsive movement of the twining tentacle Steve was dropped to the floor of the balcony and the two exposed tentacles lay quiescent. The tumult below became terrific, and the Corisian slaves cowered against the wall of the cavern. The guards started the work of slaughter in the chamber at once but not in time to prevent one of the Kellonians from catching sight of the group on the balcony. This one raised a long slender rod in one of its tentacles and directed a stream of white flame at the point where the guards had lined themselves along the rail. Steve and Ralph poured the deadly cathode rays into this monster at once, but they were too late to save two of the guards, whose bodies slumped to the floor with the upper portions completely consumed by the searing awfulness of the white flame. Another burst of flame from across the chamber struck the balcony rail and a section of it



The sight of the enormous telescope decided the professor to accept the post in the Royal Observatory.

fused away and fell dripping to the floor beneath. The captain had spoiled the aim of this Kellonian by the quick use of his projector and now there were but two of the monsters remaining. A third burst of the white flame went roofward and did no damage whatsoever as the monster directing it crumpled from the deadly cathode rays, even as he was bringing the generator into use. The last one attempted to escape from the chamber, but was dropped in its speedy flight by Steve, who shouted gleefully over his exceptional markmanship.

Kirn and Colet had gained heart at what they had witnessed and were on their feet when the battle was over.

"Back to the Comet, men," ordered Ralph, entering the passage they had left. "Which way, Kirn?"

"Follow me," exclaimed the slave. He started running down the passage as soon as the torches were brought into play.

Ralph and his men followed, Colet bringing up the rear. They hastened along the passage for perhaps half a mile, when there was a sudden scream from behind. Ralph wheeled about and saw that Colet was in the grasp of a Kellonian who had crept upon them from the rear. Before he or any of the rest could bring their ray projectors into action, the unfortunate Corisian had been pulled asunder by the twining tentacles and Ralph yelled with horror and fury at the sight. The five rays found their mark and it was all over in a trice, but it was too late to save poor Colet. Kirn mourned aloud.

"Hark!" warned the captain.

From behind them came the rustling of approaching Kellonians and faintly they heard the curses and shouts of an onrushing mob of the creatures.

"Hurry," shouted Ralph, "we must reach the Comet before they overtake us!"

CHAPTER XVIII

Disaster

WHEN Ralph's party reached the cavern of the galdons, out of breath and gasping painfully from their exertions in the rare atmosphere, the Kellonians were almost at their heels and Ralph let out a might shout as soon as he emerged into the great torn chamber which was still illuminated by the lights of the Comet.

"Help! Help!" he called. Then, marshaling his little band together, he retreated over a pile of rock until they had reached a huge boulder, behind which the entire group was able to hide. It would have been foolhardy to attempt to reach the Comet over those treacherous rocks as, in their exhausted condition, they would have been quickly brought down by the fleet Kellonians.

At that moment the passage-mouth spewed forth the first of their pursuers and Ralph stopped him with a single discharge from his weapon. But a second and third followed, then dozens of them and, as fast as these were brought down by the weapons of the defenders, more would take their place. Some of those behind were able to get their flame generators in operation, and these were directed at the huge rock, from behind which had come the death-dealing cathode rays. Ralph and his party were forced to crouch low to escape the terrific destructive effect of the white flame and there was a shout of triumph from the increasing number of Kellonians in the cavern.

But their triumph was short-lived for the Comet had risen from its berth and was approaching the scene of the conflict. Ralph, from his crouching position, waved a signal of welcome to the occupants of the spherical vessel, who could be seen with ray projectors pointing from the open ports. The white flames suddenly left the rock and were directed at the approaching ship. Ralph took the occasion to order another volley from his own men and they rose from their protected position to direct several discharges of the rays into the disorganized mass of the enemy.

Then of a sudden, all was as still as death before them and Ralph heard a warning cry from behind. Looking back, he saw that the Comet had neared them and that Teddy was waving frantically from the main window of the control room. Several spots on the lower surface of the ship showed where the concentrated white flame had burned holes through the outer hull. But no great damage had been done.

"Don't advance on the enemy!" shouted Teddy through the open window, "and take a look at what's happening to them!"

Ralph and his little band raised themselves and peered over the sheltering rock which showed scorched and partly molten streaks across the top. The mass of Kellonians along the wall of the cavern was still. Those who had recently been actively engaged with their flame generators had joined their fellows in the huge heap. Flat on the backs of their ugly bodies they lay, tentacles rigidly stretched upward as if supplicating some fiendish god. A wisp of smoke curled here and there from the mass, and the stench of singed carcasses filled the air. Not a living Kellonian remained.

"The professor must have used the energy projector on them," explained the captain. "It has induced heavy electrical currents in the bodies of those we see on their backs—those who were still living when the lightning struck them. They are nicely electrocuted and the rigidity of their tentacles is due to the fact that the current is still passing through their bodies."

At his words the stiffly stretched tentacles of the electrocuted monsters collapsed as if they had been suddenly blown down by a heavy wind—collapsed and tumbled into grotesque limp fringes that surrounded the swelling bodies. The professor had pulled the switch.

Steve yelled and capered in his glee and the rest of the party was but little less enthusiastic. When the Comet dropped to the rocks behind them, Ralph rushed to the manhole and grasped the hand of the professor, who was there to greet them.

"Fine work, Professor," he said. "You were just in the nick of time. Our projectors were almost exhausted."

He climbed into the vessel and proceeded to the control room at once, leaving the rest of his band to bring Kirn along with them. When he entered the control room, he found Teddy and the doctor bending over a figure that was stretched on the floor. They arose as he entered and the doctor shook his head solemnly. Ralph was shocked to see that the figure was that of Torvan, the Corisian astronomer. The professor was inconsolable when he learned that his new friend had been horribly killed by a burst of the searing white flame, which entered one of the open ports.

"We lost two of the guards, too," said Ralph solemnly, "as well as Colet, one of the Corisian prisoners of the Kellonians. But we have another prisoner safely with us —Kirn."

"What did you discover?" asked Teddy.

"It's a long story, Ted," was the reply, "and I think we shall learn still more from poor Kirn. They are bringing him in now."

The guards entered with the naked Kirn in their midst. He was the picture of shame and confusion and asked to be clothed at once. But he exhibited great happiness at being once more among friends other than his fellow prisoners, and at the prospect of freedom that seemed such a hopeful one after what he had seen. He was led to one of the staterooms, where clothing was provided, and Ralph told the captain and Steve to prepare a good meal for the poor creature. The professor, with the help of Romos, Valdor, and Soltur tenderly carried

Torvan's body from the Comet and cast about for a suitable place of interment among the jagged rocks and boulders.

WHEN the gloomy burial party returned, Ralph ordered that the Comet be raised from the rocks and brought to a position about central with the cavern and five hundred feet from the bottom. He stationed four of the guards in the control room with instructions to keep constant watch for further attacks from the enemy, and to give the alarm at once if any were seen entering the cavern.

He then requested that Teddy and the professor accompany him to the dining saloon, where the situation would be discussed and further questions asked of Kirn.

They were much pleased to find that the erstwhile prisoner had been clothed and was engaged in devouring an excellent meal which had been prepared by Steve and the captain. Already his appearance had changed; his eyes had taken on a new brightness and his shoulders had straightened considerably. He was beginning to regain the courage and independence of a free Corisian.

But, after Kirn had finished his first square meal in many months, he was in no condition to be questioned. He became so over-poweringly tired, that he could not keep his eyes open. Since the crew of the Comet also needed sleep, Ralph decreed that the matter should be left until the following day, and that all hands who were able to do so, should obtain their rest. Watches were again established and quiet descended on the Comet.

No untoward incident occured during the next twelve hours and all of the occupants of the vessel obtained sufficient rest to strengthen them for the tasks to follow. Kirn slept for the entire period and awoke a much refreshed and rehabilitated man. He was the most eager for action of any on board and, after breakfast, volunteered much information which later proved of great value.

He told of the activities of the Kellonians, of their use of the captured Corisians as personal servants to the most prominent members of their kind. He spoke of the harsh and cruel treatment to which they were subjected and of the orgies and horrors which followed each visit of the enemy to Coris. Some of the details he would not repeat, but what he told was sufficiently revolting to set the nerves and tempers of his listeners on edge.

"Well," said Ralph, when much of his tale had been recounted, "one thing is certain. Two things, in fact. First, we must rescue the remaining prisoners and bring them to the Comet for return to Coris. Second, we must destroy every Kellonian on this cursed satellite—destroy the satellite itself, if possible."

"It is possible," said the captain confidently.

Kirn's eyes shone with pleasure.

"I shall lead you to the cavern of horror," he said.

"Is it well guarded?" asked Ralph.

Kirn's face fell at this. "Yes, it is," he admitted, "and the guard will be redoubled as things are now. One of the things I overheard in the division council before the members were destroyed was a communication from the Mogara ordering all prisoners to their own cavern under heavy guard."

"But, is this retreat impregnable?" inquired Ralph.

"No," said Kirn, slowly, "but it is extremely difficult of access since it has but one entrance, and that through a guard room of sufficient size to house no less than two hundred Kellonian guards."

"Looks like a job for one of the captain's hand grenades," mused Ralph. Then aloud, "How great a distance separates the cavern of the prisoners from that of the guards?"

"Perhaps two hundred feet," replied Kirn, "and the passage is narrow and winds through the solid rock, with two turns in its length. Only undersized Kellonians can pass through it as it is not more than twenty feet wide."

"That sounds like an ideal protection from one of the bombs, doesn't it?" asked Ralph of the captain.

"It certainly does," responded the captain.

This was all unintelligible to Kirn, but he looked from one to the other with new hope in his eyes.

"Then you think . . .?" he began.

"Yes, we think we can rescue your companions," answered Ralph, before he could complete the sentence, "if we have good luck in getting there and getting away. There should be no trouble as far as the guard room is concerned."

"But I must prepare a much smaller grenade than was used in this cavern," said the captain.

"Yes," said Ralph, "or we should block passage and all."

"When do we start?" asked Steve.

"Just hold your horses now, Steve," said Ralph. "First, we must get this thing straight. There must be no slips. Our first job is to get the prisoners out of their quarters and safely to the Comet. That is a big task in itself, as we are almost certain to be anticipated. After that we must devise ways and means of destroying the entire breed. The captain tells us we can destroy the satellite itself if we so desire, but that remains to be seen. The first move now is to select the party to accompany me on the venture, and to make sure we are properly equipped and armed."

"I'll prepare a small grenade at once," said the captain.

"Good," said Ralph, "and I shall look into the question of armament. Don't you think a couple of the automatic rifles with the explosive bullets wo d be valuable?"

"I do," replied the captain, "e d some of the gas bombs as well."

THE captain departed to prepare his small bomb and Ralph selected Romos and Steve to accompany him, in addition to four of the remaining eight guards and Kirn as a guide. He went to the storeroom and returned with freshly charged ray projectors, gas bombs, and two of the short automatic rifles, and plenty of ammunition. These rifles were equipped with barrel clips, by which one of the ray projectors could be attached, thus serving a double purpose. The projectors were quickly fitted to the barrels of the rifles, and Ralph had two weapons of tremendous power and capabilities. The explosive bullets could be used against the enemy when in close formation and the power of the high explosive (the same as that used in the hand grenades) was so great that several of the bulky Kellonians could be killed or at least crippled with a single shot. The ray projector paralleling the short barrel could be used in the regular manner without interfering with the operation of the rifle itself. More powerful torches were provided, and at the last moment Ralph thought of the sound detector he had examined with such great interest when the captain had brought it aboard the Comet. He hastened for this little instrument and stowed it about his person before the expedition set forth. One of the combination rifle-projectors he entrusted to the captain, the other he carried himself.

Teddy begged to be allowed to accompany them, but Ralph felt that he was more valuable on board the Comet and he left strict instructions regarding the placing of lookouts and the procedure to follow in case of an attack.

The Comet was lowered to the bottom of the cavern at a point adjacent to the passage indicated by Kirn, and the expedition set forth, fully equipped. The captain had his specially prepared hand grenade, as well as two of the larger ones, for use in an emergency.

Kirn led the way with Ralph at his side and the party moved as swiftly as possible along the smooth-floored passage.

"Have the Kellonians other hand weapons besides these

generators of the white flame?" asked Ralph of their guide.

"They have not," answered Kirn, "and not all are equipped with these. But there are sufficient."

"How about the paralyzing energy and the blue flame used on the galdons?"

"Those were used only on the galdons. They never dreamed of an attack from the outside and developed the white flame generators only for the control of the slaves here."

"Well, that's some consolation," said Ralph, "I had feared that the paralyzing energy would be used against us and we should then have been in a bad way indeed."

Nearly an hour was required in reaching the location of the cavern of horror since it was necessary to stop several times at cross passages and use the sound detector, to make certain they were not in danger from unsuspected sources. Eventually they reached a point where Kirn bade them keep silence and extinguish the lights.

Ralph crept forward in the darkness with the guide until they reached an opening from the left wall of the passage. Through this opening they peered into the chamber of the guards. The opening communicated with the cavern through a short passage, not over twenty-five feet in length, and inside could be seen a number of the Kellonians fidgeting about and moving to and fro to keep alert. Others of their numbers were sprawled on low platforms, apparently in slumber. They returned to the main body of their party and Ralph directed all of his men to lie flat on their faces, including Kirn whom he left behind when he directed the captain to accompany him to the entrance of the guard's cavern.

"Captain," he said, as they moved cautiously toward the dimly lighted opening, "this seems to be an ideal place to use your small grenade. There is a short passage at right angles to this one which communicates with the chamber and you should be able to toss the bomb into their midst and retreat to a safe distance back this way before the blast occurs. At least you will be behind a solid wall of rock no less than twenty-five feet in thickness."

THEY had reached the opening, and at a glance, the captain agreed with Ralph's idea of the situation. Hesitating but a moment, he stood before the rectangular opening and hurled the bomb with all his might into the midst of the unsuspecting Kellonians. With a quick jump he was at Ralph's side some fifteen feet down the main passage and he bore his superior to the floor with him just as the jar of the explosion shook the solid rock beneath their prostrate bodies. They were deafened by the ensuing roar, and the burst of flame which swirled into the main passage well nigh reached them where they lay. The breath of the rushing hot gases, as they passed, scorched their skin and singed their hair, but neither was harmed. Fortunately, the main force of the expanding gases was expended upward through the huge ventilating ducts of the cavern. There was the crash of falling débris, then a tense silence as the remainder of their party crept forward to join them.

Following the moment of silence, there came the confused screams and shoutings of the panic-stricken prisoners in the second chamber. This was broken only by the angry booming voice of a single Kellonian, who was berating them unmercifully. Ralph and his party entered the guard chamber to find the expected scene of chaos and dismembered bodies. More than a hundred guards had been destroyed and the rescuers climbed disgustedly over the mangled bodies and the wreckage toward the entrance to the second cavern. Renewed screams and shouts came from within and it was evident that the prisoners had organized an attack on the lone guard who had chanced to be in their cavern at the moment of the explosion. Ralph's party hurried with all possible speed and soon reached the entrance to the second chamber.

Ralph and the captain passed through the communicating passage and there witnessed a horrible sight. The cavern before them presented a scene almost as terrible as the one they witnessed in the cavern they had just quitted. A squat Kellonian stood rooted in the center of the space and dozens of the puny Corisian slaves were attacking him from all sides. Numbers of them had already been dismembered by his powerful tentacles and lay in torn and bloody heaps about him. Several others were in the grasp of waving, twisting members and they screamed and struggled as they were slowly crushed to death.

"Break away!" shouted Ralph, raising his double-purpose weapon to his shoulder.

The attacking slaves slunk away from the raging monster as they saw the rescue party, and the Kellonian, with a bellow, made for the newcomers. But the cathode rays from Ralph's weapon were too quick and the bloody creature slumped to the floor in a wriggling, heaving heap, carrying three more of the prisoners to their death in his fall.

"That's that," said Ralph, spurning the disgusting creature with his foot, "and now to marshal these poor creatures together and get them to the Comet."

He left the task of getting them together and informing them as to what was transpiring to Kirn, who entered into the work with zeal and vigor. He herded the naked, emaciated prisoners into a corner of the chamber, and harangued them rapidly and earnestly.

Conditions in the cavern were too awful for contemplation. A great bare stone-walled prison it was, unfurnished and filthy. The walls and floors were worn smooth from ages of contact by nude, shivering bodies. The dead, fully twenty of them, lay in disorder about the body of the slain guard. From the arched roof, high overhead, came the flickerings of dim and inadequate lights and the air was even worse than the air in the outside caverns and passages.

The prisoners were overjoyed at the prospect of rescue and groveled at the feet of the newcomers until Ralph was compelled to reprimand them sternly. He led the way, with Kirn and Steve at his side, and ordered them to march four abreast, with Romos and the captain bringing up the rear. He stationed the four Corisian guards amongst the rescued prisoners in the line of march, with instructions to keep their torches in action and to assist those of the unfortunates who were ill or exhausted. Seventy-eight of them had been counted by Kirn, who was thankful at being able to save that number from the clutches of their captors.

IT was a much slower journey to the cavern of the galdons than it had been when the passage was traversed in the opposite direction. The poor, weak prisoners stumbled and fell. They were so under-nourished and weakened that their strength would not permit of movement at more than half the pace to which the newcomers had been accustomed. Constant vigilance was necessary to see that none fell out and were left behind. At each cross passage it was necessary to make a lengthy halt to determine that the way was clear.

More than two hours had passed when Ralph and Steve stepped forth into the cavern of the galdons, and with Kirn's assistance, aided the first of their naked wards from the passageway.

Ralph hailed the Comet, which was safely suspended in midair near the center of the great chamber and it was immediately maneuvered to a landing close to the passage mouth. One by one the bewildered slaves were conducted to the entrance manhole and gently pulled within

by Teddy and the professor. One by one these gave fervent thanks as they entered its warm, clean atmosphere. One by one they collapsed as the weakened muscles were unable to support the weight of the emaciated body, when they were once more subjected to the gravity effect to which they had so long been unaccustomed. It was a pitiful sight and never to be forgotten by the rescuers.

When more than fifty of them had been safely brought aboard, Ralph transferred his activities from the Comet's entrance to the passage mouth where he continued the count of the unfortunates, who now straggled forth into the bright-lit cavern even more slowly than had the first ones. They came by twos and threes now, speechless and dazed. Now single stragglers appeared and when a total of sixty-nine had been accounted for, there were no more for several minutes. Ralph was becoming very much concerned when suddenly two more of the wretched prisoners came. These were barely able to crawl forth from the passage. They babbled incoherently and pointed shaking, skinny fingers back into the tunnel from which they had come. One screamed in anguish and fell at Ralph's feet in a faint.

"Seventy-one," intoned Ralph. Then, agitatedly, "My God, where are the rest? Romos and the captain were in the rear."

Steve hastened to his side. "What's wrong, boss?" he asked.

"Romos and the captain—they're not here. And seven of the prisoners are missing. Something must have happened in the rear. We must go back and search for them."

He was galvanized into action and, shouting the news to Teddy, he took Steve and one of the guards and once more entered the dark passage.

Those on board the vessel ministered to the needs of the prisoners and worried betimes as to the safety of Ralph and his two companions. For two long hours they waited for their return and had just about given up hope when the three figures were seen staggering from the passage mouth—alone!

Ralph walked with bowed head and seemed about to collapse, himself. Half way to the Comet he was seen to slip and, had not Steve thrown an arm about him and supported him, he would have fallen. Weakly he pulled himself into the vessel and there he slumped to the floor, sitting with raised knees and head bowed in his arms, overcome by grief and disappointment.

"It was no use," he said hopelessly. "They're gone. Romos and Captain French. The seven prisoners. We'll never see them again. Oh, why didn't I bring up the rear myself?"

Steve patted his shoulder soothingly.

CHAPTER XIX

Annihilation

AN hour later all members of the party, excepting two of the guards who were on lookout duty, were busily engaged in tending to the rescued prisoners, many of whom were in a state of collapse and required the ministrations of Doctor DePolac and the use of remedies from the well-stocked medicine cabinets of the Comet. They were a wretched lot but so happy at their rescue that their protestations of gratitude and pleasure were pitiful to witness.

Ralph berated himself continuously for having allowed his two friends to take the dangerous position in the rear of the march from the cavern of horror and could not be consoled by anything the others might say. Teddy assured him again and again that his proper place was in the lead and that the danger might as easily have come from the front as from the rear, but his self-recrimination was not to be allayed. He had a genuine affection for Captain French and was, in addition, ashamed of his previous jealousy of him. Thoughts of that unreasonable feeling naturally led to thoughts of Margaret, and this did not add to his peace of mind. She had been very ill when they left her in Coris and concern for her added materially to his worries. He was in the most miserable state of mind he had experienced since his original visit to the doctor back there in far-off New York.

A hail from one of the guards sent Ralph and Teddy scurrying down the stairs to the control room. Here they found the guards excitedly watching a crawling figure which had emerged from one of the passageways and was making its way painfully over the jagged rocks toward the Comet. Ralph dropped through the manhole at once and proceeded in the direction of the naked, struggling Corisian who now lay quiet and almost hidden from view between two boulders. When he reached the prone figure he uttered a shout of joy which immediately changed to a groan of anguish, for he quickly saw that Romos, for it was he, had not long to live. Teddy joined him in a moment and the two men carried the limp form of the horribly mangled Corisian to the Comet.

Doctor DePolac was called from his other labors and quickly administered a stimulant to the obviously dying noble. Anxiously Ralph waited for a sign of animation and when Romos' eyelids fluttered and then uncovered the glazing blue eyes, he watched breathlessly for the first movement of the lips, which strained to convey a message.

"Captain French," gasped Romos, his thoughts now coming to the watchers much faster than he could speak, "is dead—killed by the Kellonians who came upon us unawares. So also are seven of the poor slaves. Soon I go as well, but I have an important message from the captain."

The lips could no longer form words or utter sounds, but the mental message continued:

"The twelve thousand pounds of the high explosive should be conveyed to the floor of this cavern and packed as closely as possible in a single heap. There is a detonator in the fourth drawer of tool cabinet R in the machine shop and this is provided with a time clock which should be adjusted to fire the explosive when the Comet has reached a distance of no less than two thousand miles from Kellos. The captain vows this will destroy the satellite completely and forever rid Coris of the menace of the Kellonians. He also—stated—that——"

But the voice and the brain were forever stilled and no more of the message could be conveyed. The Corisian guards mourned openly, and Ralph heaved a great sigh, as he realized that his fears had become a certainty. But, in a way, this certainty was better than the mental picture he had carried of the possibility of long drawn out torturing of his friends by the Kellonians.

Tenderly they shrouded the torn body of Romos in clean white sheets and carried it to the refrigeration room of the vessel. At least he should have a decent burial on their return to Coris. The captain was not so fortunate—Kellos would provide his tomb and then only until its destruction.

Romos' message was communicated to the professor at once and he considered the problem carefully for several minutes before expressing an opinion.

"Well," he finally said, "we have all seen the tremendous power of this explosive in small amounts, and it may be that the captain was correct in his assumption that the amount we have on board is sufficient to destroy this satellite. In fact he spent several hours in computing the forces required and asked me many questions regarding the probable density and internal structure of Kellos. At any rate it is our only chance, and we can do no better than make the attempt. The surface of Kellos is deeply seamed and scarred, as we all observed, and it may be

that some of the extensive surface cracks extend to a sufficient depth to assist materially in allowing the expanding gases to break up the body."

"But, suppose the Kellonians locate the explosive and remove the detonator before it has had an opportunity of setting off the charge," objected Ralph.

"There is a possibility of that, of course," answered the professor, "but I believe it is a remote one. In the first place we shall be compelled to burn away the partition still remaining in the shaft so that the Comet can return to the outside. This will release the air pressure in this division of the Kellonians' domain and, even though they might reach this cavern and find the explosive after we have departed, they will discover at once that suffocation impends and will hasten to pass through the air-locks into adjoining divisions to escape it."

"Will there not be danger of injuring our vessel if we use the energy projector to make an opening into the shaft?" asked Teddy.

"I have been thinking about that," said the professor, "and have come to the conclusion that we have nothing to fear. When the energy breaks the first opening through the partition, there will be an immediate escape of air into the shaft at considerable velocity. This air, though vile, contains sufficient oxygen to allow the metal of the partition to be consumed and blown upward in fine, incandescent particles. I cannot conceive of any molten metal dropping to the surface of the Comet in sufficient quantity to cause any damage. And that brings to mind the necessity of repairing the outer hull before we leave. Several places were burned completely through by the white flames of the Kellonians and these must be sealed tightly to prevent leakage of air from our vessel."

"That is true," said Teddy, "I shall get out the welding apparatus at once and, with Steve's help, close the openings with patch plates."

He and Steve departed at once for the machine shop.

The professor sighed. "It is hard to think of the captain as no longer being with us," he said sadly. "But his spirit lives on, and we must follow through his pet scheme of planting the high explosive in this cavern."

"Yes. And we must find a good spot among the rocks in which to locate the charge. There are one hundred and eighteen canisters in the magazine and it will be quite a task to get them all in place. Of course, while they weigh one hundred pounds each on the surface of Coris and within the Comet, they will weigh but twenty pounds each in the cavern. Nevertheless, in this infernal atmosphere, the exertion of handling them will be considerable."

"That's true," said Ralph, casting off his feeling of depression, "we must get started at once."

HE stationed two of the guards as lookouts once more, and called the other six to assist in the placing of the canisters of explosive. The Comet was moved to the opposite side of the cavern where they found a pit in the mass of broken rock, which appeared of sufficient size to hold the explosive and to hide it from view of any Kellonians, who might enter the cavern after their departure. The canisters were of small size and not extremely difficult for the huge guards to handle, so it was soon found that each of them could carry one canister at each trip and deposit it in the pit without trouble.

Teddy and Steve, hiding behind great goggles, were busily engaged in welding the patches to the lower portion of the Comet where the damage had been done. The professor located the detonator and was examining its mechanism to learn how it was operated. He wound the clock and found that it worked perfectly. He discovered the method of setting it to operate the firing mechanism at any predetermined time. Slowly the orderly heap of canisters increased in size until but twelve remained in the magazine. Then came a shout from one of the lookouts. A stream of Kellonians was pouring from the mouth of a passage not more than five hundred yards from the spot!

Teddy and Steve had just completed their welding job and took up their ray projectors immediately. Ralph had the combination automatic rifle and projector at his shoulder almost as quickly and the guards backed them up as they poured a deadly fire into the ranks of the advancing enemy. Several bursts of the white flame failed of their mark as the distance was too great, and by this time the automatic rifle at Ralph's shoulder spat forth its deadly missiles in the direction of the foe. The din was terrific as each bullet from the gun exploded with a roar that echoed and re-echoed through the cavern like the report of a cannon. At each concussion the air was filled with flying stones and mangled portions of Kellonian bodies. The engagement was of short duration for, with fully twenty of their number either blown to bits by the explosive bullets from Ralph's rifle, or stretched in sudden death by the cathode rays from the projectors in the hands of the others, the remainder of the attacking party scrambled into the passage mouth and disappeared.

But this attack impressed Ralph with the necessity of completing their task and getting away with the greatest possible speed. The remaining twelve canisters were rushed to the pit and the detonator set in place, well hidden in the pile. The professor had set its mechanism to allow them an hour and a half to reach a safe distance. All ports in the Comet were closed and only the manhole remained open when, from no less than ten passages simultaneously hundreds of the enemy streamed and advanced rapidly in the direction of the vessel.

Through the open manhole Ralph discharged the automatic rifle as fast as it would fire, spraying the advancing horde with sudden death. He shouted to Teddy to raise the Comet to the roof of the cavern and to Steve to obtain a number of the gas bombs from the magazine. In a moment it would be too late, for it was impossible to stem the tide of the enemy, and soon the white flames would be at work on the lower surface of the Comet.

The spherical vessel rose with a jerk and, in a moment was at the entrance of the destroyed air-lock. Steve slipped several of the gas bombs into Ralph's hands and hurled several others into the milling mass below. Those he had handed to Ralph followed immediately and the pops of their bursting could be heard as the manhole cover was hastily bolted shut. With the bursting of the bombs there spread a thick yellow cloud over the bottom of the cavern and the horde of Kellonians went scrambling and clawing for the openings through which they had entered. But, as the yellow clouds overtook them, they dropped in their tracks, screaming and raising such a noise as to penetrate through the double hull of the Comet. Then all was again still for the yellow vapor had covered the entire cavern and was searching every cranny and crevice for its prey. None could live in that vicious cloud.

"Another close shave," said Ralph, mopping his brow, "but I fancy the gas will keep the cavern clear until we make our getaway."

"But," said Teddy, "when we make the opening through the partition, the escaping air will carry the gas with it."

"And by that time," laughed the professor, "the Kellonians will be glad to stay out of the cavern anyway. They will be hustling for other divisions to get to places where their air supply will not be cut off."

"After that will come the big surprise," gloated Ralph, "and my only regret is that their destruction will be too sudden and painless. They should be made to suffer as they have caused others to suffer."

The pressure in the Comet was gradually brought up

to that of the normal atmosphere on Coris and some little difficulty was experienced by the occupants in again becoming accustomed to their natural breathing. By this time the Comet was near the partition and the professor manipulated the controls of the upper energy projector to direct its power into the metal plate which shut them off from the great shaft. In the control room Ralph and Teddy observed the proceedings in the disc of the periscope and both exclaimed jubilantly as a white-hot spot appeared on the surface of the metal and then burst through with upward streaming showers of brilliant particles.

"The professor was right," said Ralph, "and we shall be out in a short time."

The shriek of escaping air came to them, even in the control room, and soon the opening in the partition was of large enough size to pass the Comet. The upper searchlights were turned on and the shaft was brilliantly illuminated for a mile above. Teddy pulled the control lever and the Comet shot upward, accompanied by the escaping atmosphere of Kellos.

"We're off!" he exclaimed gleefully as the walls of the shaft slid past with ever increasing speed.

Steve carried the news to the unfortunate Corisians in the quarters above and their joy was indescribable. Kirn could scarcely contain himself, since there had been disbelievers among his compatriots and now all of his words to them were proved true.

It was necessary to limit the speed of the Comet to prevent colliding with the sides of the shaft and Teddy kept his eye glued to the image in the periscope and his fingers constantly on the sensitive controls. It was for this reason that more than an hour was required to traverse the three hundred miles of the shaft's depth. The professor had figured correctly in his setting of the detonator.

When they emerged from the mouth of the shaft, the flaming orb of the sun was almost overhead and the occupants of the Comet gazed once more into the depths of the universe with relief and joy. Teddy accelerated their velocity rapidly and within fifteen minutes they had reached a point more than two thousand miles from the surface of Kellos. A strange phenomenon manifested itself as the blackness of the satellite receded, for the escaping air provided a reflecting medium for the sun's rays. At first the moisture-charged column of air gave the appearance of a wavering, dimly-lit jet of steam. Then it spread out, umbrella-shape, and crawled sluggishly along the surface of the body until it covered a considerable area of ever-increasing brightness. It swirled and billowed upward continuously, but the gravity of Kellos was still sufficient to cause a portion of it to spread over the surface and cling as an atmosphere for a time to its parent body. The surrounding disc of blackness was still of huge size to their vision and the professor considered it advisable to retreat still further. Their position was accordingly taken up at three thousand miles distance, and upon referring to the chronometer, Ralph informed the others that only five minutes remained of the time allowed in the setting of the detonating clock. Then all awaited breathlessly the moment when Captain French's prediction should be proved or disproved.

A tense stillness pervaded the control room as all eyes strained to observe the first sign of the effects of the explosive.

"Time's up," announced Ralph.

A minute passed—two minutes—and nothing happened.

Kirn groaned. It seemed that their work had been for naught. But at that moment Ralph let forth a triumphant shout, for a great flame suddenly shot forth from the mouth of the shaft and, simultaneously with its appearance, a network of flaming crevices spread out over the surface of the satellite, radiating from the shaft mouth in crooked widening lines which spread rapidly until a great area was criss-crossed by its ever increasing magnitude. A great portion of Kellos broke away and went hurtling into space, spinning crazily and throwing off streamers of flaming particles. Another followed and then many more, until finally a huge section, breaking into several smaller portions, as it was heaved up by the force of the explosion, left an enormous visible crater which the professor estimated as more than five hundred miles across. The shock of the concussion had evidently been of such tremendous effect as to break off and tumble into ruins the countless pointed spires with which the surface was covered, for the remainder of the satellite became dimly visible by virtue of increased reflecting power.

The great crater blown into the heart of the body increased slowly in size as more of the exterior was broken up and carried off into space. Kellos reeled drunkenly, and the huge wound inflicted by the captain's explosive slowly turned upward, until it disappeared over the top of the brightening disc.

"Kellos is unbalanced and will be thrown from its orbit," exclaimed the professor in an awed voice. "Truly, this is the end of the Kellonians."

The Comet was withdrawn still farther from the scene as the disturbance increased in extent and rapidity. Faster and faster whirled the satellite, the crater of the explosion appearing at each revolution and showering surrounding space with an eruption of incandescent fragments. As the movement became swifter and swifter, the satellite wabbled and lurched, until it was thrown to one side with a sudden increase in velocity. The appearance was that of a huge pin-wheel, with only one of the driving elements in action. The acceleration now became so rapid that the satellite developed into a receding ball of increasing brilliance, with a continuous stripe of flaming incandescence about its new equator. It whirled off into space, trailing in its wake a tail like that of a comet.

STEVE was first to regain his equanimity and his expressions of triumph and satisfaction rent the air of the control room with explosive exuberance.

"If you feel as good as that about it," said Ralph, "how do you suppose those poor devils we rescued must feel? And look at Kirn here. I'll bet he hasn't wrinkled his face into smiles like that since he was captured and carried away from Coris."

The Corisians were indeed happy and they showered the earth-visitors with expressions of gratitude and adulation. It was with thankfulness in his heart and tears in his eyes over the joy of the Corisians that Teddy pressed the levers which sent the Comet toward the harassed planet they had left only thirty-six hours before.

"Well," said Ralph, "that's finished. Now, let's get back to Coris with all speed. I'm worried about Mary."

Teddy smiled encouragement as he increased the speed of the vessel to more than three hundred miles a second. "We'll be there in less than an hour, old man," he said.

The professor glanced at the barometer and uttered a startled exclamation. "The pressure is down to twenty-seven inches!"

His observation was quickly confirmed and he and Steve rushed to the upper compartment to inspect the oxygen apparatus. When they had left the control room and the occupants became silent in contemplation of the new development, a faint hiss beneath their feet told of the cause of the difficulty. One of the openings burned through the hull by the white flame of the Kellonians had been overlooked and the atmosphere of the Comet was escaping into outer space!

Steve and the professor soon returned with the news that the oxygen generators were operating to their utmost

capacity. But the barometer now registered twenty-six and a half inches! It was a white-faced group that faced them as the announcement was made. Consternation was registered on every countenance.

There was no means of calculating accurately the amount of time required to reduce the density of the air to the point of suffocating them, since they did not know the size of the opening in the hull through which the precious oxygen was pouring. But Teddy was equal to the occasion and the whine of the machinery overhead mounted rapidly as the Comet's speed was increased to shorten the journey as much as possible. Up, up mounted the needle of the speed indicator and down came that of the barometer. Faster and faster sped the Comet until Teddy, who was relying entirely upon instinct and judgment, estimated that their journey was about half completed. The barometer stood at fourteen inches and the breathing of the occupants became rapid and labored. They had reached a speed of more than ten thousand miles a second and this rapidly decreased as the controls were manipulated to bring them gradually to a safe approaching velocity by the time they reached the outer atmosphere of Coris.

Many of the weakened Corisian prisoners were gasping and sobbing for air and Kirn lay stretched on the floor of the control room in a coma. As the whirring of the machinery reached lower and lower tones, the occupants of the control room struggled and fought to keep alive in the constantly rarefying air and one by one they were reduced to the extremity of sitting or lying on the floor on account of their increasing weakness. Lungs worked spasmodically, alternately drawing in the thin air in great gasping inhalations and then ceasing to function temporarily while their possessors grew black in the face with threatened suffocation. Teddy clung desperately to the controls as they neared Coris, though his head was swimming and his lungs seemed about to burst.

Nearer and nearer they approached and the speed of the ship became less and less as they neared the green-tinted atmosphere. Ralph gasped an exclamation that was unintelligible; then he too slumped to the floor and crawled to one of the ports where he commenced fumbling with the cover bolts. Suddenly they had entered the atmospheric envelope of Coris and were soon into it to sufficient depth to reach breathable air. With a despairing cry Teddy fainted at the controls, but he had adjusted them to bring the Comet to a halt and permit it to float in mid-air.

Ralph felt himself going as he loosened the last bolt of the circular port and, as he did so, the cover was blown inward with the force of the inrushing outer air. The barometer had fallen to nine inches and the influx of the life-giving air of Coris as it poured into the ship sent it upward immediately. Fortunately the increase in pressure was not too rapid. The diameter of the opened port was not very great. But, with the gradual restoration of the pressure and increase of the oxygen supply, life returned to the inert beings, who so lately had been on the point of succumbing. One by one they returned to normal breathing and strength. Ralph was the first one on his feet and he hastened to Teddy's side where he was relieved to find that his friend was also recovering, albeit slowly. He gazed through the open port and saw that they were over the inky ocean of Coris and at not more than six thousand feet elevation. The barometer stood at twenty-four inches.

Teddy had recovered entirely and looked inquiringly at Ralph as he resumed his seat at the controls.

"All right now?" asked Ralph solicitously.

"Okay," said Teddy. "But that was another close call, I'll say. We made the trip in seven and a half minutes and were not a second too soon at that."

Ralph nodded in solemn acquiescence.

CHAPTER XX

Farewell

THE Comet drifted with a light breeze while attention was given to the rescued Corisians, most of whom were in bad shape from the latest misfortune. But, with the able advice and instruction of the doctor, these were all restored to satisfactory condition within a comparatively short time. All portholes and windows of the vessel were opened and, when normal respiration was reached, the passengers indulged in the luxury of inhaling deeply of the invigorating equivalent of the mountain air of Coris.

With sextant in hand the professor mounted to the upper surface of the Comet and soon established their position by observation. They had been provided with a chart before they left for Kellos and, a short time after establishing the position, they were headed for Seritanis, eight thousand miles away.

The excitement of Kirn and his companions as they neared the capital city increased by leaps and bounds and the erstwhile despairing prisoners made merry in the dining saloon and lounge as their spirits soared to new heights.

Ralph's concern over Margaret's condition increased apace and he was in a blue funk over it when the brilliantly gleaming buildings of Seritanis were sighted in the distance.

Teddy was far more cheerful and looked forward to rejoining Mary with keen anticipation. For this reason he had pushed the Comet to its utmost speed and caused them to cover the eight thousand miles in less than three hours, though it was necessary to increase altitude somewhat to accomplish this. It was a nice balance between friction limitations and breathable air density that determined the rate of travel.

When the Comet finally dropped into the square before the palace, great multitudes had gathered to welcome them and the din of this celebration far surpassed that which had greeted them on their arrival from Tinus. But, this time, the queen had provided a double line of guards which extended from the manhole of the Comet to the entrance of the palace, and Ralph and his party were able to pass between these without interference from the wildly excited crowd. But, when the first of the rescued prisoners appeared and the multitude saw that many more of their unfortunate compatriots followed, they broke through the lines and a great scene of confusion followed. Such a scene of riotous demonstration had never been witnessed in Seritanis, and to this day it is spoken of in Coris as the greatest of all time. But Ralph and his companions succeeded in reaching the palace without being detained and carried about on the shoulders of the mob. Some little time was required to restore order and to gather together the bewildered prisoners and convey them to the Royal Hospital where they were to be restored to health and strength by Thalia's own physicians.

They were usherd into the presence of the queen without delay, but Ralph was too full of his thoughts of Margaret to relish the task of apprising the council of the happenings of the journey. He therefore imposed this responsibility on the professor and excused himself. Knowing his anxiety, Thalia readily excused him and settled down to the business of obtaining the story from the professor and Teddy.

Ralph hastened to the chamber where Margaret lay ill and was overjoyed at being permitted to see her. But, when he saw the pale wan features of the girl he loved, he was overcome with fear for her safety. Margaret greeted him with a sweet smile and great tears rolled down her waxen cheeks as she endeavored to raise her head and found she was too weak to do so.

"Oh, Ralph, my dear," she whispered. "I am so happy that you have returned to me safely. I know I shall recover quickly now."

Too choked to answer, Ralph knelt at her bedside and buried his head in the pillow beside hers, touching his lips to her temple in reverent thankfulness. Mary and the nurse turned their heads, as Margaret's sobs of relief and happiness broke the ensuing stillness.

But his happiness was short-lived for the nurse soon took him from the bedside and insisted on his leaving the room.

"While your safe return has buoyed her up," she explained, "it is absolutely necessary that she be spared further excitement. You must not remain longer."

He tore himself away with difficulty and was accompanied to the door by Mary and the nurse. They stepped into the hall and the nurse closed the door quietly behind them.

"Exactly what is her condition?" asked Ralph anxiously.

"Well," said the nurse slowly, "it is puzzling to the doctors. The fever has abated but she seems to grow weaker rather than stronger. Possibly worry over your trip has caused this, in which case she should commence picking up at once. At any rate, there is no immediate danger."

Ralph was, perforce, satisfied with this and immediately communicated to Mary the news of their success. Though not wishing to leave Margaret's side, she was extremely anxious to see Teddy, so she returned to the sick room to see how things were. Almost at once she returned with the cheering news that Margaret was sleeping quite peacefully and naturally, so with eager steps she accompanied Ralph on his return to the council chamber.

WHEN they entered the presence of Thalia and her court, the professor had just finished his recital and a deep silence pervaded the room. Thalia, bright-eyed with enthusiasm, arose when they entered, and all eyes turned in Ralph's direction. Mary rushed to the side of Teddy, who greeted her in the traditional manner of the ardent lover. But the queen and her courtiers were as oblivious of their demonstrations as were the lovers of their surroundings.

"Ralph Prescott," spoke Thalia in a quivering voice, "be so kind as to approach me closely."

Evidently the professor's recital had created a profound impression and had credited Ralph with the ultimate success of the venture.

When Ralph reached a position facing the queen, he dropped to one knee, but was immediately raised by the gentle touch of her hand on his arm.

"Ralph," she said with great emotion, "do not bow to me. Rather should I bow to you, for you have this day saved my people. The ability of your companions, under your courageous and far-seeing direction, has done what my own people have been unable to do for generations."

Ralph stood erect and flushed painfully as the queen bent from her seat and kissed him tenderly on the forehead. From the small finger of her right hand she withdrew a beautiful ring, encrusted with diamonds and rubies, representing a five-pointed star, circumscribed by a circle of the same stones.

"In addition to the heartfelt gratitude of all Coris," she continued, "I now bestow upon you the Order of the Royal Star. No greater honor can be conferred in my domain and, while I know you are not to remain with us to reap its benefits, I hope this emblem will bring to you whatever of success and joy you most crave in your own sphere."

Much embarrassed, Ralph thanked her to the best of his ability and retreated as soon as possible to the side of the professor.

"Confound you, Professor," he hissed, "what did you want to make such a fool of me for?"

Professor Timken only laughed as he looked affectionately into the eyes of the flustered young man.

The atmosphere in the council chamber altered suddenly as, carried by six of his dearest friends, the body of Romos was brought in. They had covered the beloved remains with a robe of golden cloth and gently the six nobles lowered it to its resting place before the throne. Reverently Thalia bowed her head in grief and silent prayer. The entire court followed suit as Ralph and his companions tip-toed their way from the room.

"Poor old Captain French," said Ralph feelingly, when they had reached the corridor, "his remains are somewhere in the depths of space, disintegrated. Romos will lie in state and be mourned for by the entire court, but our loss is as great as theirs and I am sure most of us will feel our loss as deeply as they feel theirs."

This was the first Mary had heard of the loss of the captain and she was as shocked and grieved as if she had lost an old and very dear friend. This venture on which they had so blithely set forth from the earth had drawn all members of the party very closely together.

MANY days of celebration and fêting followed, but Ralph had no heart in it, since Margaret was not at his side. Daily his fears for her increased, for she did not seem to respond to treatment as had been expected. He was only permitted to visit her once a day and then for but a few minutes. On each visit she appeared to him to be growing weaker and paler and he was terrified at the thinness of her hands—those beautiful hands which now lay immovable on the white covers, the delicate blue veins showing clearly against their ghastly whiteness.

Mary shared his concern and found considerable difficulty in continuing with her shorthand notes of the occurrences during the journey that resulted in the destruction of Kellos and the salvation of Coris. Each day she spent several hours with Teddy and recorded the events as described in detail by him. But she had no heart in the work, for her thoughts, too, were constantly returning to the sick room, where the quiescent form of Margaret seemed to be wasting away to nothingness.

WITH the loss of Torvan, there came an opportunity to the professor, for Thalia offered him the post vacated by the death of the astronomer in charge of the Royal observatory. It was a great temptation to him and he was undecided for days. His ties to the earth were strong, yet not so strong as to prevent him from considering the matter seriously. The chance of exploring the heavens with the wonderful instruments of Coris was not to be easily cast aside and he pestered Ralph and the doctor continuously for advice as to what course he should follow. He felt certain that Mrs. Timken would agree to join him in Seritanis for at least a few years, during which time he would have obtained a great deal of valuable and coveted knowledge and experience. And, with the invention of the Comet, this would be a simple matter to provide for, since voyages between the two planets would now become common and of more or less regular occurence.

Steve Gillette was conspicuous by his absence from the company of the rest of his companions, and it soon developed that he had taken a position with the Tritu Leboru so as to be near Rena, the operator who had accompanied them on their expedition against the Kellonians over the island of Prastia.

When Ralph learned this, he took the impetuous Steve into his chambers and questioned him.

"Steve," he asked, "what are your intentions in this matter? Surely you don't intend to remain here when we leave?"

"What else can I do, Chief?" he replied. "I can't leave her."

"Wouldn't she consider returning to the earth with you?"

"Huh! Do you think I'd take her back there and have all those boobs around my neighborhood making fun of the difference in our height. I guess not!"

"Have you asked her?"

"Asked her to marry me," said Steve shortly, "and that's all settled. As far as that goes, she'd go back with me if I wanted her to, but I'm not going to suggest it. I've no relatives to go back to, and this is going to be a pretty good little old planet with no more Kellonians, so I don't see why I shouldn't stay. Besides, I'm already getting a big kick out of the mechanism of these thought telegraphs or whatever you might call them. Some nifty repair work they need, and it's just the kind of work I like."

"The professor might remain also," said Ralph.

"Honest? Boy, that would be great! He's a good scout and would be someone from home to talk to once in a while."

"Well," laughed Ralph, "I guess I can do nothing to dissuade you, and I'm not sure but that you have the right idea at that."

His face clouded as he thought of Margaret, so wan and still.

"I wish things looked as rosy for me, Steve," he finally said. "I am very much upset over Margaret's illness."

"Isn't she getting any better?" asked Steve sympathetically.

"No. She seems to be failing and these Corisian physicians are puzzled. It is very discouraging."

"Why don't you take her home?"

"That will depend on what Doctor DePolac has to say. He is going to consult with her physicians this afternoon. But I tell you, Steve, I am panicky about it."

"Don't worry, Chief. She'll be all right."

But Steve's cheerful prediction was far from the truth, for that afternoon, when the doctor visited her, Margaret's legs were paralyzed to the knees and the puzzlement of the Corisian physicians increased to the point of despair. This fever, which had stricken the girl from far away Tinus was never known to act in this manner with a Corisian.

Margaret had slipped into a state of semi-consciousness from which it was practically impossible to arouse her and Doctor DePolac set about making a thorough examination of her with efficient promptness. He handled her as tenderly as if she had been his own daughter and, when he left the room an hour later, the expression with which he greeted the anxiously waiting Ralph was grave in the extreme.

"Ralph, my boy," he said, "we must get that girl back to the earth without delay. There is only one man in our world who can help her now."

"What is her trouble?" asked Ralph, with sinking heart.

"She is now afflicted with a creeping paralysis, brought about by this strange disease of Coris. The disease itself has been curable, but in a system differing from that of the Corisians, it has produced an unprecedented result. A certain nerve center in her body is affected and is gradually ceasing to function, thus cutting off system after system of the branching networks as the deterioration progresses. The cerebral nerves are unaffected, so it is a matter that is out of my province. But John Reynolds can save her if we can get her to him in time."

The doctor's lips compressed to a thin line, as Ralph's eyes beseeched him.

"Is she likely to—to die?" whispered Ralph.

"What is worse, my boy, she might live; a hopeless cripple. That is, unless we can get her to Reynolds at once."

"Why are we standing here, then?" asked Ralph.

A MEETING of the council was hastily called by the queen and the urgent need for their visitor's departure was made known. She appointed a committee of four to accompany the Tinusians to their home and to negotiate for the purchase from Sorenson of several of the space fliers and to arrange for their delivery in Seritanis. She spoke glowingly of the future—of regular interstellar traffic between Coris and Tinus—of the benefits to accrue to both by the resulting interchange of ideas and commodities. A hasty farewell was taken of the visitors and every resource of her staff was lent to the speeding up of their departure.

The professor decided to remain and to accept the post in the Royal Observatory and Thalia was overjoyed at his decision. Steve, too, was to remain and the date was set for his union with Rena. Teddy spent the intervening time in conversation with the professor, who intrusted him with the mission of breaking the news to Mrs. Timken and of persuading her to join him in Seritanis on the next voyage of the Comet. Teddy assured him that the Comet would not be long away and that he would do all in his power to convince Mrs. Timken of the advisability of the move. But he extracted a promise that the professor would give up the idea and return to the earth if his efforts to convince Mrs. Timken proved unsuccessful. This was readily conceded by the professor, who was confident of the loyalty and courage of his mate.

The news of their impending departure was quickly spread through the medium of the Tritu Leboru, and when the stretcher-bearers appeared with the still form of Margaret carefully supported in their midst, a crowd had again assembled in the square. But now it was a silent assemblage of sympathetic well-wishers who prayed for the recovery of this earth girl who was beloved of Ralph, their hero.

Tenderly Margaret was laid in her own bed on board the Comet and Mary made her friend comfortable after the stretcher-bearers departed. The doctor remained in constant attendance.

The committee of four Corisians was taken aboard and, with a final wave to the assembled multitude, among which could be made out the rather forlorn looking figures of Steve and the professor, Ralph closed the manhole cover and bolted it shut. Teddy was at the controls and, by the time Ralph reached his side, the machinery was already in motion. Lucky it was that the hole in the hull had been repaired immediately after their return.

"How soon can we make it?" asked Ralph eagerly.

"I'm not just sure," replied Teddy, "but we'll try to do it in about six hours. The professor advised me that only sixty-two million miles now separate us from the earth on account of the shift in the relative positions of the two planets during our stay here. That will require a speed of less than three thousand miles a second and I am almost certain that the Comet can stand that continuously. She didn't seem to hesitate at nearly seven times that speed on the way here, but of course that was only for a short time—when the meteor passed us."

As the Comet rose gracefully from her berth, there was not a dry eye in the crowd that packed the square. Neither was there any noise or confusion, but when Ralph bravely waved a signal as he stood before one of the large windows of the control room, there was an answering gesture from hundreds of those within his view. Somehow a lump had found its way to his throat and he stood silently at the window watching the rapidly receding city of Seritanis with dimmed eyes.

The rising note of the generators told of increasing velocity and Ralph joined Teddy again as they rose above a bank of clouds which hid the city from view.

A great fear clutched his heart as he thought of poor Margaret lying so desperately ill in the room above their heads. What if they were too late? What if Doctor Reynolds was unable to save her? He felt that life would then cease to exist for him, and he groaned aloud in the anguish of his thoughts.

"Don't take it so hard, old man," said Teddy comfortingly. "We'll make it. And I've heard of this Reynolds. He's a wizard. In his hands you will have nothing to fear."

But Ralph was not to be comforted and he departed for the upper regions to learn what he could of Margaret's condition.

"My God, Teddy!" he exclaimed, when he returned a few minutes later, "she's paralyzed to the hips now and the doctor won't let me even see her. What's our speed?"

It was near the three thousand mile mark and still rising. Coris was now a ball of swiftly diminishing size and of blue-green brilliancy.

"Here," said Teddy, to take his friend's mind from his troubles, "mind these controls for me while I make some observations, will you, Ralph?"

"All right," was the half-hearted reply and Ralph took the unfamiliar seat as Teddy made his observations with the sextant-like instrument.

WITH the observations made, Teddy returned to his place and made some minor readjustments of the controls to set them exactly on their course. He then experimented with the speed, bringing it up gradually and watching the instruments carefully at each step. At four thousand miles a second there was indication of slight over-loading of some of the machinery after a period of several minutes at this velocity, so he reduced it to 3,800. Here it appeared that there was little likelihood of trouble, so it was kept at the increased speed for some time. A half hour passed and there was still no indication of trouble, so he allowed it to remain at this figure, though he kept his eyes constantly on the recording thermometers and the electrical instruments which indicated the performance of the complicated machinery that whined so insistently above them.

"We'll make it in less than five hours at this rate," gloated Teddy, "and the old Comet sure is performing beautifully. I'd like to try her for maximum speed in a short spurt, but that can wait until some other time. We mustn't take any chances this trip."

Ralph paced the floor like a caged animal. And in his extremity he missed the captain acutely for some reason. He missed Steve and the professor, too. And the doctor, confound him! Why didn't he come down with a report once in a while?

The minutes passed like hours, though the Comet was speeding them homeward at an unheard-of maintained rate. The arrival of the four Corisians in the control room and their unending bombardment of eager questions regarding the construction and operation of the vessel provided some diversion for a time, but it was not long before Ralph made another visit to the stateroom where Margaret lay. This time the news was no better, though not worse, and Ralph's impatience increased as the Comet staunchly maintained its terrific pace.

When they were still ten million miles from the earth, nearly forty-five minutes of travel, he thought of the radio and hastened to the room that housed the two receivers and the powerful short wave transmitter. He threw the switch that turned the power into a dozen transmitting tubes and clamped the head-phones to his ears. Shakily he spoke into the microphone. His call was for 27-SA, the radiophone in John Sorenson's private office. Minute after minute he spent in repeating this call, and in waiting between calls for a reply. But none came and he returned to the control room disappointed.

Another twenty minutes and the deceleration of the Comet was begun. They were nearly home and the earth was now a brightly shining green disc which seemed to be rushing forward to meet them. Doggedly he returned to the radio room and renewed his calls for Sorenson.

In not more than five minutes he was rewarded by a faint "Hello." And they were still a million miles from the earth!

"Hello! "Hello!" he repeated excitedly into the microphone, "Sorenson?"

"Yes," came the faint reply. "Who is this?"

"Ralph Prescott, aboard the Comet," he replied.

"Heaven be praised," came Sorenson's voice, a bit more distinctly now. "Where are you?"

"Nearing earth rapidly. And we are in great trouble. Miss Sprague is seriously ill and we must rush her to the famous Doctor Reynolds in New York. Will you get in touch with him and make the arrangements?"

"Sure thing." The voice was considerably louder now. "I'll communicate with him at once. Where will you land?"

"New York municipal airport," replied Ralph, "and hurry!"

"Right," came the reply. "So long."

The radio was dead and Ralph returned to the control room, shaking with excitement.

"Just talked with Sorenson over the radio, Ted," he said. "He is arranging with Reynolds and we are to land at the airport of New York."

Teddy gazed pityingly after him as he rushed for the stairs and bounded upward to apprise the doctor of what he had done.

CHAPTER XXI

The Return

WHEN John Sorenson's aerocab alighted at the airport of New York, its motors sizzling hot from the speed at which they had been operated, the Comet was already landed. An air ambulance was drawn up alongside and Sorenson hastened to the spot to greet his friends and to render such assistance as might be required. He had called the great surgeon at once after the communication from Ralph and all arrangements were made for moving the sick girl from the airport to Reynolds' private hospital. He rushed to the manhole of the vessel in time to see Ralph and Teddy, with two strangers of huge size, emerge with a stretcher on which lay a still form covered with blankets. Behind them came the doctor and Mary and they were followed by two more of the strange giants. The stretcher was slid gently into the open door of the ambulance and Ralph and the doctor followed into the white-painted craft. An orderly closed the door behind them and the craft was off in the direction of the city.

"Teddy," called Sorenson.

"Mr. Sorenson!" exclaimed Teddy in surprise, "you arrived here quickly. And I'm glad you came, because we want to follow and see how things come out for poor Margaret."

He greeted his employer warmly and was rewarded by the most friendly expressions he had ever received from the financier. Mary, too, came in for an enthusiastic greeting from the great man. And to his credit be it said that he did not mention the question of publicity. Nor, for that matter, did it even enter his mind since he heard the despairing call from the Comet.

"What seems to be the trouble with the young lady?" asked Sorenson, leading the way to his aerocab.

"She is afflicted with paralysis, caused by some nerve

affection brought on by a disease she contracted while on Venus," replied Teddy.

"Poor girl," exclaimed Sorenson. "Is it curable?"

"Why, Doctor DePolac says that Reynolds can cure it by an exceedingly delicate operation, if we are in time," was the reply.

"Let no expense be spared, Teddy," said his superior. "I will personally pay any bills involved. I feel responsible, because it was through my interference that these young ladies were allowed to make the hazardous journey."

"I imagine Ralph will permit no one but himself to take the responsibility," said Teddy. "He and Margaret planned to marry as soon as we returned."

"Too bad. Too bad," exclaimed Sorenson, shaking his head.

They had reached the large aerocab which had just borne Sorenson from his home in Philadelphia in record time. The four Corisians stood about, ill at ease. Teddy laughed as he noticed this.

"Mr. Sorenson," he said, "these are Corisian nobles from the court of Queen Thalia—inhabitants of Venus, you know."

He presented them in turn and each bowed respectfully from his great height as his name was spoken. Sorenson took his first good look at the giants and his astonishment at their magnificent physiques and strange costumes was unbounded."

"Do they speak our language?" he asked.

"It isn't necessary," said Teddy. "They'll understand anything you may say to them and in turn will make themselves understood to you. Thought transference, you know. And they are here to purchase a couple of ships like the Comet."

Sorenson pricked up his ears at this and, when all were ensconced in the cab and headed for the city, he addressed a few halting remarks to the nearest of the Corisians. He was astonished to find that his meaning was clear to the listener and that the measured reply was intelligible to him, though he understood not a word of those actually spoken to him. He experimented still further and, by the time the aerocab reached the landing platform of the hospital, he was engaged in an animated discussion with the visitors from Venus.

"I am going to take the committee to Philadelphia with me," he announced, as Teddy and Mary stepped from the cab, "and will arrange for their accommodation in my home. When Miss Sprague is out of danger, we shall all get together there and discuss things in detail. Be sure to advise me of the result of Doctor Reynolds' operation as soon as possible."

"Indeed we shall," responded Teddy. "I'll give you a ring as soon as we learn anything definite."

Their farewells taken, Mary and Teddy hurried to the waiting lift, and Sorenson's aerocab swung off rapidly toward the south.

In the waiting room on the sixtieth floor they found Ralph, a dejected figure, pacing the floor with ill-concealed nervousness. He welcomed them with haggard countenance and with trembling lips.

"What's the verdict, old man?" asked Teddy.

"They have her in the operating room now," said Ralph tonelessly. "Reynolds didn't have much to say. Just rushed her in there and told me to wait. DePolac is assisting in the operation."

Mary settled into a chair and clasped her hands so tightly together that the knuckles showed white and bloodless. She was as worried as Ralph, but did not wish to let him see her agitation.

"How long did they think it would require?" she asked.

"About three-quarters of an hour," Ralph replied, looking at his watch, "and they have had her in there for twenty minutes now."

His suffering was so acute that Mary turned her head and asked no more questions. Teddy picked up a magazine and pretended to become absorbed in its pages.

THE minutes lengthened to an hour and still there was no word from the operating room. Mary gazed from the window unseeingly as darkness fell and the great lights of the city took over the illumination of the canyons, which were its streets.

Ralph's misery deepened as time dragged on. His mind was a chaos of memories and fears. In his thoughts he reviewed the events since he had first met Margaret—the quick appeal she had made to him when he first visited Doctor DePolac—the shock when he learned she was to accompany the Comet on its initial journey—his jealousy of Captain French—the thrill of the moment when they had confessed their love for each other. Each recollection was as a knife thrust in his heart and he clenched his fists and gritted his teeth in his agony of spirit. He consulted his watch every few seconds and was appalled at the slowness with which the minute hand moved. When an hour and a half had passed he could contain himself no longer and rushed from the room to the corridor. He reached the door of the operating room and paused, listening intently. Not a sound came from behind the white enameled door, but the odor of ether was overpowering, sickening. His heart sank and he twisted his fingers into his hair in anguish. Teddy had followed him silently from the waiting room and now grasped him gently by the arm.

"Come on now, old man," he said. "You can't do any good here and you are only working yourself up to a point where you are liable to need a doctor yourself."

"But they are so long," came from Ralph's white lips.

"Yes," said Teddy, as he led his friend back to the waiting room, "but I have seen operations that required more than two hours. It is nothing unusual and only shows that extreme care is being exercised."

Mary was frankly sobbing now and the sight served somehow to bolster up Ralph's courage. His eyes filled as Teddy left his side and, with arms about her shaking body, attempted to comfort the weeping girl.

"Here, here, what's all this?" came the voice of Doctor DePolac from the doorway.

Mary dried her tears and looked up as Ralph rushed to the doctor's side and eagerly questioned him.

"The operation was a success," said the doctor, peering at him through his thick glasses, "but we cannot tell much about the patient's chances until she comes out of the ether, which may not be for several hours. Her pulse is very high, of course, but it is strong and there is every reason to hope that she will entirely recover."

Doctor Reynolds now joined them and Ralph sensed the greatness of the man as soon as he was presented by Doctor DePolac. His remarkably intelligent gray eyes held a gleam of friendliness and benevolence that cheered Ralph at once.

"Do you think that she will recover, Doctor?" asked Ralph.

"I think so, my boy," answered the great surgeon. "Of course we can never be absolutely certain in these cases, but you can rest assured that she is receiving every possible care and attention. She has an excellent chance of recovering, though I almost despaired of her when she was brought in. Do you wish to see her?"

"If I may."

Teddy remained with the doctors while Mary and Ralph were led to Margaret's room by a pleasant-faced, white-capped nurse. It was with a feeling of awe that they entered the ether-charged atmosphere and gazed at the still form of the girl they both loved. So white and rigid she lay that it seemed the wonderful spirit had left the tortured body, but they were quickly assured by the

nurse that her condition was satisfactory. Ralph lifted one of the limp hands to his lips and hurried from the room to conceal his emotion. Mary followed him quietly.

WITH the news next day that Margaret would recover, Ralph's spirits soared, and he hastened to communicate with Mary. He was keenly disappointed because he was not permitted to visit the sick girl, but he had a mass of cheerful flowers and plants sent to her room. Mary was delighted at the news, but complained that her editors were besieging her for the first instalment of her story of the voyage of the Comet. The evening newspapers of the night before had carried screaming headlines announcing the return of the space flier, and gave considerable space to a description of the four visitors from Venus and to the story of Margaret's illness. But Sorenson had given out nothing else and the world was waiting for the story of the trip. She was thus obliged to cut short her conversation and rush to the offices of the *Blade*.

It was an astounded world that read of the exploits of the little party that had set forth so bravely less than two months previously, to render assistance to the inhabitants of Venus. And the world could not doubt, for the photographs brought back by the reporter of the *Blade* were as convincing as was her remarkably well written story. Scientists read to scoff, and then continued with the story to become believers and to render praise for those who had accomplished the impossible. Sorenson was besieged with offers of fortunes for his patent rights with requests for quotations on vessels similar to the Comet; with letters and radiograms begging for permission to embark on the next voyage into space. Teddy was equally pestered and they found it extremely difficult to resume normal activity.

The visitors from Coris negotiated contracts with the firm covering the manufacture and delivery of two of the space fliers at a price of five million dollars each, payment to be made on delivery in gold, platinum, and iridium. These vessels would be of slightly larger size than the Comet and would be provided with larger rooms and larger furniture to accommodate the needs of the Corisians. Teddy started the designs at once and the factories of the corporation commenced work on the order from another world. The competitors of Sorenson were confounded, and stock in the corporation reached new high levels, as a flood of buying orders descended upon Wall Street.

Mrs. Timken rushed home from Florida upon reading the news and made haste to visit Teddy Crowley. She was a handsome, energetic woman of forty-five and her merry eyes sparkled as Teddy confirmed the statements made in the newspaper articles.

"It is the best thing that could have happened to my husband," she exclaimed. "He was wasting his life in the observatory here, with his absurd clinging to obsolete ideas and methods. It will rejuvenate him and start him anew on the way to the fame and honor he justly deserves. I shall join him at the first opportunity."

"Good for you, Mrs. Timken," said Teddy, taking her hand. "And you will not regret it. Seritanis is a beautiful city and you will find the people extremely friendly and congenial. The professor is beloved of them greatly and yours will be a position of high honor and luxury."

"How long will it be until the next trip can be made?"

"Probably about two months. It will require about that time to construct the new vessels ordered by the Corisians and the Comet will accompany them on the trip to Seritanis. You can be booked as a passenger on the Comet at that time."

"Oh, that is wonderful, Mr. Crowley," she enthused. "I shall make immediate preparations."

Teddy nodded with pleasure as she tripped from the room and bid him farewell. "Great little woman," he thought, "and won't the professor be tickled?"

RALPH visited the hospital daily and exulted over the increasingly hopeful reports of the progress of the patient. Then came the day when they told him he could see her and his cup of joy was filled to overflowing. He entered the clean white room on tip-toe and reached with trembling fingers to caress the tumbled raven locks which spread over the pillow. Margaret's head was turned toward the window and she had not heard him enter.

"Sweetheart," he whispered.

She turned wondrous shining eyes in his direction, and Ralph's heart pounded a tattoo within his breast, as he observed the sweet smile and the mounting flush which greeted him. She lifted white arms to him, and as he had done in Seritanis, he fell to his knees at her bedside.

"My dear, my dear," she crooned, burying her head in the hollow of his neck and twining her arms about him. "I'm so glad I was saved—for you."

"Thank God, yes," murmured Ralph reverently.

Day by day Margaret's strength increased and it was not long until she was sitting up. Then followed days of recuperation in the extensive sun rooms in the top story of the building, and finally came the time when she was discharged as fully recovered. But ravages of the illness had left their mark and it was Doctor DePolac who advised a trip to Florida and an extended rest there, to build up her strength and restore her to the full vigor and remarkable vitality that had been hers.

"But, Doctor," she objected, "I can't leave Ralph for two months."

"Well," laughed DePolac, "why not marry him and take him with you?"

Margaret flushed delightfully and the doctor stamped from the room, chuckling to himself, as he observed that Ralph was at the door, waiting for admittance.

It was thus that a double wedding was arranged and quietly performed in the home of John Sorenson. Those present included Doctor DePolac and the four guests from Venus. The doctor removed his glasses and wiped his eyes several times during the ceremony. It seemed almost as if he were losing a favorite daughter. There would be a vacancy in the secretary's office of his establishment that would be impossible to fill.

After the ceremony, the two happy couples hurried to the airport to catch the night liner for Miami, which stopped at Philadelphia to take on passengers on its nightly trips from Montreal and New York. Work on the new space fliers was progressing satisfactorily, so Teddy had allowed himself to be persuaded by Sorenson that he could spare at least a week for his honeymoon. But for Margaret there had been decreed a stay of no less than two months and Ralph looked forward to many happy days with no care but that of his bride, and to the complete restoration of her health and strength.

In their old-fashioned way Sorensen and the doctor gave them a send-off at the airport which tickled the risibilities of the many passengers of the great air liner and it was with a storm of good-natured, though embarrassed, protest that they scurried through the passage to their staterooms amid showers of rice and confetti.

IT was five weeks later when Ralph hurried across the beach to the spot where Margaret lay stretched luxuriously beneath a gaily-colored parasol. She sat erect at his approach and greeted him with a smile of contentment and anticipation. Her scarlet bathing suit revealed a figure which had regained its natural lines of beauty and well-being and her wondrous color bespoke the wisdom of Doctor DePolac's advice.

"What is it, dear?" she asked Ralph.

(*Continued on page* 427)

RAYS *and*

NEXT to interplanetary stories, stories of the future seem to rank highest in the favor of our readers. It is natural that we should be interested in looking ahead—not only into our own lives, because they, after all, are very much limited—but into the life of the world, so to speak. That is limitless, as we count time.

Besides looking into the future through the eyes of a scientist or perhaps a mechanic or architect, Miles J. Breuer looks into the future through the eyes of a doctor. And because he is particularly adept at putting his notes into literary form, he gives us a cleverly written story of absorbing interest and scientific value.

PROLOGUE

THERE were some among those to whom I first told this story who had the idea that I was relating a wild dream produced by the influence of an unknown narcotic. But those to whom I had the opportunity to show the pink line of scar around the middle of my right thigh and the difference in size and pigmentation of my two legs, became silent and thoughtful. To those who asked me point-blank, was it or was it not a dream, I was forced to say that I do not know and cannot know. All I can do is to ask them: Is not *time* a function of living organisms, whose "living" depends upon irreversible chemical reactions? Any ray or chemical substance that can in any way influence the irreversibility of those chemical reactions which constitute "living" will certainly play strange pranks with what we know as "time."

CHAPTER I

A Discovery in Anesthesia

I GRADUATED from the University of Chicago Medical School in 1926 and took my year of interneship in the Lincoln General Hospital, because I was planning to settle down in Lincoln and practice medicine there. I had entered the study of medicine because I was fascinated by the scientific aspects of the work; for medicine is the science that is built up out of a score of fundamental sciences. Now that I was learning the meaning of the practical side of the profession, and beginning to realize how little of science entered into it, I looked with dismay at the life ahead of me.

A lifetime of making my living out of the distresses and misfortunes of my fellow-beings; taking their money at a time when they could least spare it; patching up the dire catastrophes that result from the blunders of the individual and of the social organization. For example, right now I have under my care two very sick men, one with typhoid fever and one with tuberculosis. The one fell ill because the community failed in its sanitary measures, the other because he is trying to fill a position in the social order to which he is not physically adapted. Ignorance, neglect, failure to see and to apply are responsible for these men's illnesses. The community or the State owes them, not merely a cure, but an apology and restitution. And here am I, a physician, struggling with these problems single-handed, and forced to take of these men's subsistence to keep my own self from starving.

Fortunately, I was kept extremely busy at the hospital, so that I had very little time for such discouraging thoughts. I maintained a cheerful front, as did the other internes. Dr. Mendenhoff, the venerable old chief of staff, had the faculty of making us young beginners feel as though we were doing a big work in the world. Bauer even managed to keep his hand in pure scientific endeavor, in spite of all the handicaps and discouragements that practical medical work holds out against scientific effort.

Bauer was the oldest of the internes—oldest in years as well as in service. He had spent some years in training as a research chemist; then his father's success in surgery decided him on a medical career. For a year he had been spending his spare time in a corner of the hospital laboratory in the effort to synthesize a more perfect anesthetic. He had a lot of gas-burettes and combustion tubes; he had drums of hydrogen sent in, and over and over again produced flasks of a very light, pungent, volatile liquid. I helped him with his efforts to work out its physiological effects on rabbits and dogs, and was very much impressed by the whole proceeding.

I had fully intended to learn much more about it from him; he had stacks of sheets covered with formulas in which the aliphatic carbon chain figured prominently. But I never got around to it. Up to the time that my finger became infected, I had gathered the idea that his stuff was some sort of a nitryl-hydrocarbon derivative. The experimental work with it demonstrated that it produced no nausea, nor any depression of the cardiac or respiratory centers, and was dissipated a few minutes after the cessation of administration. He was rather eagerly trying to study out how to manage his first trial of it on a human patient.

Then it was that I infected the middle finger of my right hand while doing a dressing on a pus case. The thing began to look dangerous, and the surgical staff member advised me to have it opened and drained under an anesthetic. Bauer was present; I saw inspiration leap into his face. He looked at me pleadingly. I felt so sick and miserable that I did not think about it twice. Offhand I volunteered to have his new anesthetic used on me, with only a lackadaisical interest in the outcome.

I rode to the operating-room on a wheel-chair, the pain from my finger throbbing through me like the strokes of a big engine; and as I climbed on the table, it occurred to me that perhaps I was conferring a favor on humanity in serving as the first subject for Bauer's anesthetic. Then the fussy little nurse laid a folded wet towel over my eyes.

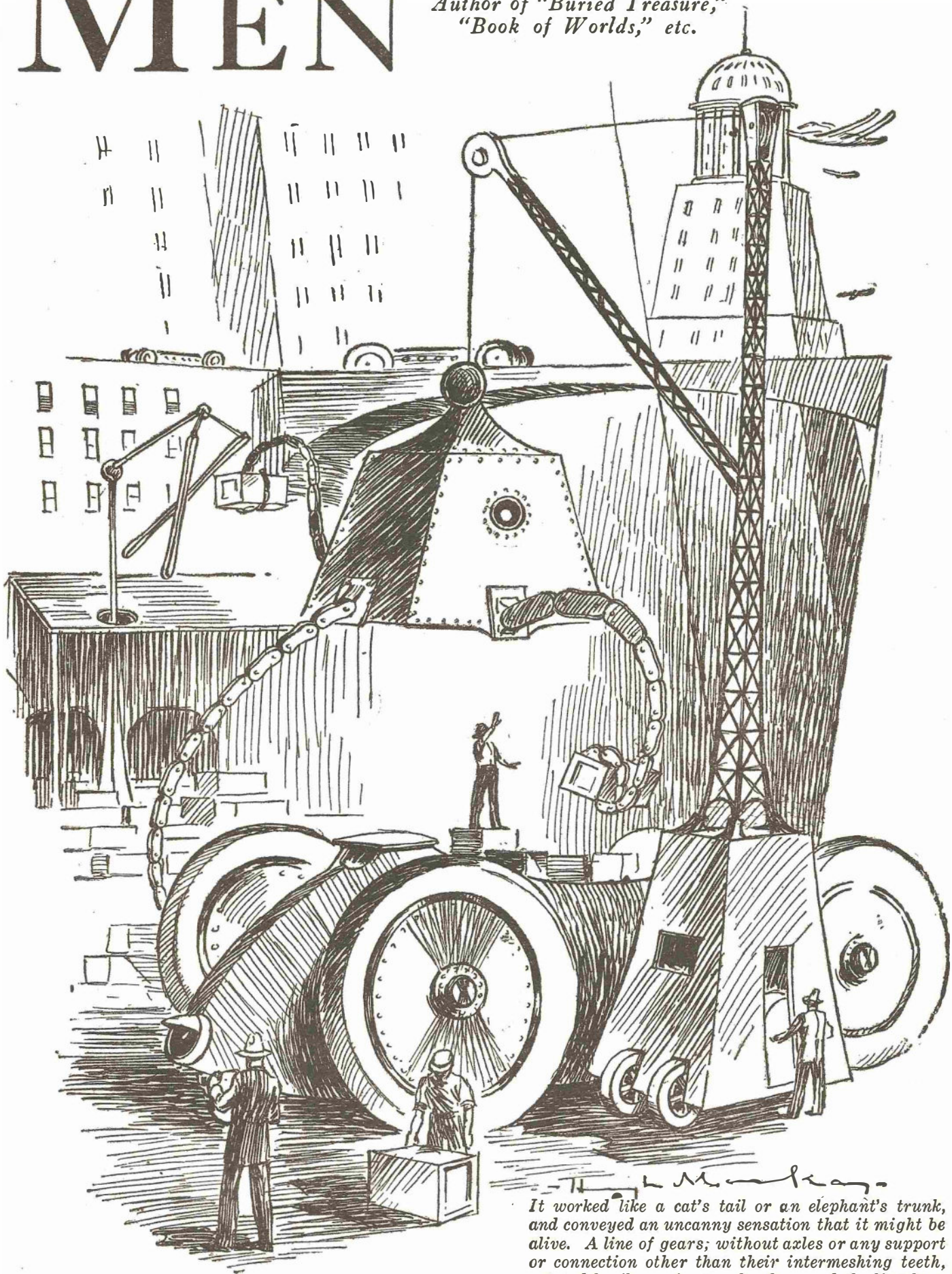
Only after I had taken the first few breaths of the sweetish vapor that tingled in my lungs, did I begin to feel misgivings for having submitted to a thing so uncertain.

"If I never get out of this," I thought, "it's my own fault."

But I seemed to slide down out of consciousness so rapidly that I forgot it in a moment, and continued to breathe deeply in happy content. The last thing I remember was a vast, open, bluish airiness, and an intense ringing in my ears.

MEN

By Miles J. Breuer, M.D.
Author of "Buried Treasure," "Book of Worlds," etc.



It worked like a cat's tail or an elephant's trunk, and conveyed an uncanny sensation that it might be alive. A line of gears; without axles or any support or connection other than their intermeshing teeth, rotated busily against each other, and the line bent and swayed, but held intact.

CHAPTER II

The Awakening

WHEN I opened my eyes I was not in the operating-room. I wasn't in my own room. But, I wasn't interested in where I was. So I closed my eyes again and lay a long time, resting comfortably. I lay on something so soft that I seemed to float.

The next time I looked, raising my heavy eyelids with great exertion, I seemed to be in a vast hall with walls of marble or some similar, almost translucent thing, pervaded by a soft twilight. My pleasant lassitude, in which I moved nothing but my eyes, lasted many minutes, during which time I observed over me a slender framework with thin glass plates in it, which covered me like some sort of exhibition-case in a museum. On an upright rod near my feet were a number of instruments with dials, a kymograph which was producing curves in red and blue, and thermometer-like scales. That was interesting. I lifted myself up to see what manner of instruments they might be, and found my head was tremendously heavy. There was a faint "clickety-click" among the instruments on the rod, and from the distance a gray-clad nurse sped toward me.

She seemed very much excited as she stopped outside the glass and looked at me. I laughed. Curious thing. Why should I laugh? It was undoubtedly some property of Bauer's anesthetic. My own laugh reached my ears as a thin, weak cackle. This served only to increase the excitement of the girl. She was young and fresh-looking, with classically regular features and a translucent complexion. Indeed she looked very pretty to my eyes. She reached down and pulled up a cord from the floor, and I felt a fresh, warm current of air on me.

Undoubtedly she was a nurse, though the cut of her uniform was different from any I had ever seen. But when I saw how the men were dressed, the strangeness of her garb ceased to trouble me. One man hurried in a few moments after she arrived; he had on some gray, flabby stuff, a jacket with sleeves to the elbows, a white ruffled collar around his neck with a flower in the front of it, and a pair of trousers that seemed to end at the bottom in slippers. The other man looked like a neatly dressed monk. He appeared a few moments later in a flowing cloak of brown. It occurred to me that cloaks lend a grace and a majesty to the movements of men, especially elderly men, that no modern clothes can give.

"He's awake!" the nurse exclaimed. My being awake seemed to be an intensely exciting matter.

The men glanced at the instruments on the rod, and the man in brown leaned toward me. The glass was gone; I was mystified as to what had suddenly become of it. Later I learned of the transparent membrane which contracted to a thick, brown ribbon when one edge was released.

"How do you feel?" he said to me.

Just yesterday I had been going around the wards asking the same thing of patients. I merely nodded; I did not feel like talking. He said something to the nurse and she went away. I regretted to see her go, for she was pleasant to look at. The men fell to talking rapidly in what sounded to my ears like a foreign language. Then I found that I could distinguish numerous English words in it, but could not catch the drift of what they were saying. As they talked, I fell asleep again.

When I awoke again I was in a little green room, on a gray metal bed. Over my head were several rows of bright copper rings as big as platters, strung on rods and emitting a sound. The nurse in gray stood over me, and as I opened my eyes, the rushing drone among the copper rings died away, and she swung the whole apparatus sidewise away from the bed. My mind was clear, and I felt strong and well. I sat up and looked myself over: I had to admit that I looked pretty thin. My infected finger was not painful, and looking at it, I saw that it was healed. A white linear scar remained over its palmar surface. As I was puzzling between my shrunken condition and the healed finger, the man in the brown cloak entered. The cloak had a rich, silky luster.

"What has happened to me?" I asked. Now my voice seemed quite normal.

"You're doing excellently," he replied, looking over some indicator dials at the end of the bed. I had to listen hard to understand what he said. He snapped the words off short, and put inflections and accents in unusual places. He noted my strained efforts at listening, and continued to speak with a slow and careful preciseness:

"We've put eighteen kilos on you in the last three days."

I remained silent and was tremendously puzzled.

"Let us see if you can stand up," he suggested. I stood up and walked without any trouble.

"Three days!" I exclaimed. "Have I slept that long?"

THE nurse looked at me, smiled bewitchingly to herself at what I had said, and slipped out of the room. Whatever strange place I had gotten into, I was glad she was in it; she lent the only touch of human reality to all this vast mystification.

"I know you are puzzled," said the man in the brown cloak, biting the words off crisply. "We have been feeding you intravenously while you slept, and you have gained eighteen kilograms in weight. We have been trying the dynabole on you—" indicating with his hand the copper rings and the cabinet from which they swung —"rather a new thing, but it seems to be giving good results. Replaces that portion of the food required by the human body to produce energy. If we ever come to use it extensively, all the food we shall require will be to replace tissue waste. A couple of meals a week. But—" he changed his tone—"I have an unfair advantage over you. Let me introduce myself. I am Dr. Deland, Head of the Lincoln and Lancaster Hospital."

"Dr. Deland," I replied formally, "I am glad to know you. My name——"

"We know you very well, Dr. Atwood. In fact, I think we can tell you a good deal about yourself that you do not know."

I looked at him steadily. Also, I closely scrutinized everything in the room. Certainly it was all elaborately prepared. Who he could be I could not imagine. But there was no question that I was the subject of some kind of a huge practical joke. The *Rho Sigma Tau's* had done such things in our old undergraduate days; and this was another stunt worthy of the old gang. Even to the lovely nurse! Whom in the world had they gotten to play her part? She had certainly taken me in.

"Go on with the game," I said jocularly. "This looks like the best one yet, and I'm ready for all you've got. But I'd give a dollar to know who *you* really are."

He regarded me for a long time in silence. The kind, solicitous benignance of his attitude was certainly acted out to a finish.

"What's it all about?" I said again, gaily. "Now that my finger is healed I'll take on the bunch of you. Let her rip."

He shook his head and there was a solemn expression in his face.

"I know about your finger," he said. "It healed two hundred and fifty-four years ago. You have slept from the effects of nitrylcylene for two and a half centuries!"

"Good boy!" I applauded. "I knew you fellows had something good, and I'm not disappointed."

"I have been trying to spare you the shock," he said, half to himself; "yet perhaps that will be the best—over and done with quickly."

He turned to me.

"Just put on some clothes and come with me."

He pointed to a folded pile, and noting my puzzled regard, helped me put them on. There was a baggy pair of trousers ending below in comfortable shoes, and a blouse with a ruffled collar. They were tough and strong, but thin and light as paper; they hung loosely in silky folds that were cunningly worked into the cut of the garment. Clever, indeed!

Then he led me down thirty yards of green corridor. We went up a silent automatic elevator, and later reached the end of a short, gray passage. As he opened the door, a rushing roar rolled into the peace about us. The wall of the building was two feet thick; the door opened on a balcony, and through it I could see brilliant masses of buildings and huge shapes moving majestically high in the air. My jocular attitude collapsed, and left me amazed and trembling.

"Behold Lincoln of 2180!" said Dr. Deland quietly.

CHAPTER III

Two and a Half Centuries

I STEPPED out hesitatingly. The magnificence, the glory, the teeming activity of it struck me suddenly, hard, like a huge flood of water. I grasped the rail for support, for it made me feel weak.

"Lincoln!" I gasped.

We were on the roof of the hospital, on the south side of a little tower-like structure, a good hundred feet above the street. Two hundred feet away were the roofs of the buildings on the opposite side of the street, great, graceful structures of a bright, glassy material. The one immediately opposite had a dozen huge, white columns in a row, and farther down, a greenish, translucent structure was a wonder of great interlacing arches. Hundreds of enormous buildings of different degrees of gleaming translucence, in tints of pink, blue, green, and gray were spread before me, with domes, porticoes, huge statues, and graceful little towers. All of them harmonized in respect to size, style, and tint; the city at which I gazed was not a hodge-podge of individual buildings; rather each building was an essential part in a unified design.

The individual buildings had a tendency toward a pyramidal shape; high up there was more space about them than on the ground. Toward the north there was a general decrease in the size and number of the buildings; while to the south and east they grew higher and more splendid, until in the distance, apparently in the center of the city, they were surmounted by a huge, bright shaft, towering into the heavens high above the rest. That tower—I had seen it only in architects' drawings, but I recognized it with a leap of the heart. That one familiar thing among all this strangeness had only been a dream, a matter of blue-prints, when I fell asleep two hundred and fifty years ago; and here it stood, massive and beautiful: the world-famed Nebraska State Capitol building.

There were huge things in the air, great fish-like affairs that rose, circled, and sailed away; and countless little darting ones, scurrying hither and thither, up and down; and a deep, droning hum, not unpleasant to listen to, came from all of them. The rush of traffic came up from below, and I moved closer to the railing to look down. Again I clutched the railing in astonishment.

The street looked like a river, crowded with people dressed in light tints of various colors, and an occasional one in a dark shade. Streams of them poured swiftly by into the distance. At first it puzzled me. Then in a moment I understood. The street itself moved in longitudinal sections, each half in an opposite direction; at slow speed near the edges, while the middle sections which were also the highest, moved so swiftly that they seemed a continuous stream of changing, blending tint. Next to the buildings was a stationary strip on which people walked, gathered in groups, and sprinkled into and out of the buildings. I let my eyes follow one man in pale orange as he came out of a doorway, crossed the stationary walk, stepped up on the moving section and moved slowly eastward; then he stepped up from one section to the next, each time moving more swiftly, until I lost him in the distance, whirling away on the middle section.

"Where is the traffic?" I asked, though it was long before I could speak. "I see only people on foot."

"Below," he replied. "The street is two-storied here."

I could not speak any more. Either because of the violence of the shock to my emotions, or because I was not yet in as good physical condition as I had thought, I was trembling from head to foot. My body began to sag until I thought I would fall. Dr. Deland supported me, and signaled for a little self-propelled cart, which conveyed me back to the gray bed in the little green room. Down in the quiet and subdued dusk of the chamber, that dazzling, whirling, magnificent spectacle still shone before my eyes.

I GAVE up my last effort at defending myself against the realization of what had happened to me. It was a fact that somehow I had crossed that awful gulf of years. It was a fact that I was alone; all my friends, who had made life worth living, were gone, mouldered and forgotten, generations ago. I was alone in a world, the terrific complexity, speed and high pressure of which were glaringly obvious to me at the first superficial glance. I could imagine how an upper Congo native would feel, if he were suddenly set down in the middle of Broadway.

What would I do here? How could I ever find my place in this seething world? What would become of me in such a merciless maelstrom? Things had looked discouraging enough for me back in 1926, even though I was then thoroughly prepared for my function in the world. To have the difficulties before me suddenly increased a thousandfold dismayed me utterly. I was hurled into a despair so blank, so devoid of any glimmer of hope, that I lay motionless and face down on the bed, perceiving nothing, caring nothing.

Curse Bauer and his anesthetic! Then came the realization that Bauer was no more, not even a memory, and my misery was renewed. I only hoped that I could be eliminated quickly.

I felt a gentle touch on the back of my head. It was a soft little hand. I turned my head moodily, and saw the nurse standing beside my bed.

"It will not be so bad as all that," she said in a voice full of interest and sympathy. "Just think! they have been waiting for generations for you to wake up. They will take care of you well. You will be a special. Oh, what a jingle time for you!"

I jerked myself to a sitting position on the bed and stared at her.

"Are you people mind-readers?" I exclaimed.

She looked at me a moment and then continued. Obviously she had not understood what my question meant.

"You are lonesome," she said kindly. "I knew you would be. The doctors never thought of that." She smiled. I noticed that her eyes were brown. She sat by me a while and did not speak. I asked her what her name was.

"Elite Williams," she replied with another smile that noticeably brightened up the universe.

Somehow I felt better. Although Dr. Deland seemed to be trying hard to be kind and hospitable to me, yet everything he said and did merely emphasized the gulf between us. But this girl, so lovely and so capable, really *understood*. How much it helps if only someone understands! When she got up to leave, I did not protest; I knew she had her duties. But I felt desperately that I could not

let her go. I wanted her to sit here by me forever. With her sympathy, perhaps I could manage to hew me out a place in this world after all.

CHAPTER IV

A Strenuous World

I DID not recognize the ingredients of the supper that was brought to me, but its taste was very pleasing. During my subsequent meals it was only rarely that I was able to tell what I was eating; there were various pleasantly colored and flavored cakes and gruels and gelatinous dishes, and many fluid and semi-fluid ingredients. The next morning, Miss Williams, who was attending to some apparatus in the room while I breakfasted, cheerfully informed me that I could have my breakfast intravenously if I preferred.

"Do very many people eat—or get their nourishment that way?" I inquired.

"Not very many. We use it sometimes for sick people; and for well persons when they are busy and don't have time to eat."

"Wow! what a world!" I thought to myself. "Don't even have time to eat!" Like a pang, the depression of yesterday swept over me when I thought of it. Instinctively my eyes sought comfort by resting on Miss Williams as she worked about the room at things unintelligible to me.

She was tall, nearly as tall as I, but gave no impression of tallness; rather, she gave an impression of grace and vitality. She moved with perfect ease and a suggestion of buoyancy about her that made her seem to radiate a glow of fresh, vigorous health. She had brown hair with a bright sheen on the fluffy parts of it, done up lightly about her head; and her eyes were active and merry.

A nameless thrill filled me as I gazed at her perfectly proportioned face, her clear skin, her supple movements. There was something about the beauty and health of her that was different from the girls of my own time. I could feel my heart going wild and my head dizzy, though I liked the sensation.

Then Dr. Deland came in and spoiled it all. I wanted her to myself all the time, even though she was busy and hardly conscious of me. But I determined, for her sake, to buckle down and get interested in things, to understand them, and to make something of myself among these people. Back over Dr. Deland's shoulder I saw her look at me and nod her head in approval.

I turned to listen to Dr. Deland; and then for a moment my mind stopped in amazement. Her expression and attitude had shown approval of my determination to throw off my discouragement. But how could she have known what I thought?

I had to let the problem go for the moment, for Dr. Deland was talking.

"——since you are trained as a medical man, you will enjoy seeing the medical things first, you will want to become acquainted with our twenty-second century civilization. Come with me; I have some things to show you today."

Mutely I followed him to his office. There sat the younger man in gray. I judged that he was also a medical man, in some junior capacity. He was talking to a keen-faced, slightly gray-headed man in a pale violet cloak, about whom the most noticeable thing was a busy, brusque air. Dr. Deland introduced me.

"Mr. Shepard," he said. "Mr. Shepard makes airplanes."

Mr. Shepard looked worried.

"That's a lot of time to lose," he complained. "It will ruin me. Competition is mighty close nowadays."

"We can do it right away," Dr. Deland patted him on the back consolingly. "To-morrow is Sunday, and Monday morning you can be back at your office at work."

Mr. Shepard followed the nurse who came after him, shaking his head and muttering with worried anxiety. Dr. Deland called after him:

"It will do you good to forget your business for a couple of days."

Then he nodded to me and led the way down the corridor.

"Operating room," he informed me in the terse fashion to which I was beginning to grow accustomed.

I was keenly interested in the operating room. It was large and gray, with many pieces of apparatus ranged around the walls, reminding me vaguely of X-ray machinery. However, the operating-table in the middle looked familiar, as did the preparations of the surgeon and the nurses. Mr. Shepard was wheeled in, swathed in white.

"Appendix!" said Dr. Deland. His snappy manner was incongruous in a man who looked so old and kindly. "Must come out."

"But—" I stammered. "You told him he would be back in his office Monday—day after to-morrow!"

"Yes," sighed Dr. Deland. "Life is too busy, too strenuous nowadays. We cannot spare much time to lie around in bed."

Noting my stare of amazement, he continued, smiling:

"Let's see. In your comfortable and leisurely day an appendectomy required two weeks in bed and another month of rest—a tremendous amount of time to waste.

"Now, we first of all eliminate the shock by means of our anesthetic, which has no after-effects of its own. It consists of a generalized nerve-block caused by a form of radiant energy electrically produced, and known as Theta Violet 60. Then we have various methods of accelerating wound healing. In this case we shall inject tethechrome for the deeper structures, and expose to Kowalski rays for the skin and fasciæ. You can stand by and watch it grow together. By this time to-morrow, healing will be complete."

I stood there and watched the young man in gray wheel up a big cabinet and attach cables to the patient's chest and feet; I watched an appendectomy performed in just the way I might have done it myself; I saw them inject the wound with an intensely red substance and sew it up with a little machine like a hair-clipper; and all of the time my mind was troubled with the thought that this business man was too busy to spare a day and a half for the purpose of saving his life from an abscessed appendix. I thought of the whirl of people in the street and the throng of them in the sky. They themselves complained that it was strenuous. How then would I find it?

THESE thoughts buzzed in my head while Dr. Deland led me around most of the day and showed me things in the hospital; and I saw the things he showed me as in a daze. I have only a confused recollection of them. The endoscope was rather a wonderful thing: a sort of little telescope that made its own incision through the patient's body wall, and explored around inside the liver or lungs and took photographs of the gross and microscopic structure within, and then closed up behind itself the wound it had made. I saw a patient receive an injection of some opaque mixture in the blood and then watched on the fluoroscope of an X-ray the streams of the opaque fluid going through the valves of his heart, and filtering through the capillaries of his lungs and kidneys. I saw a man with a terrifically red and swollen knee; they swung an affair like an automobile radiator over it, and I watched it grow pale and relax in the course of twenty minutes.

"We can control the secondary induced radiations so accurately that we can regulate the dose to kill one form of life and not another," Dr. Deland explained. "When we

have an infection, we determine what organism is present, set the specific dosage for that, and the patient's tissues escape without any effect whatever. Then the dose is altered so as to decompose the products of bacterial growth into harmless substances."

"But there are so few patients here," I remarked. "The hospital is two-thirds empty."

"This thousand-bed hospital was built a hundred years ago," he explained. "At that time it was appropriate for the Lancaster District. To-day it is triple what we need. There is less illness. Infections are prevented; accidents are prevented; people are born healthy and are trained to remain so. We have proportionately many more doctors and nurses than you had in your day, and plenty of work for them to do. But as their work is largely preventive and educational, we have fewer sick people."

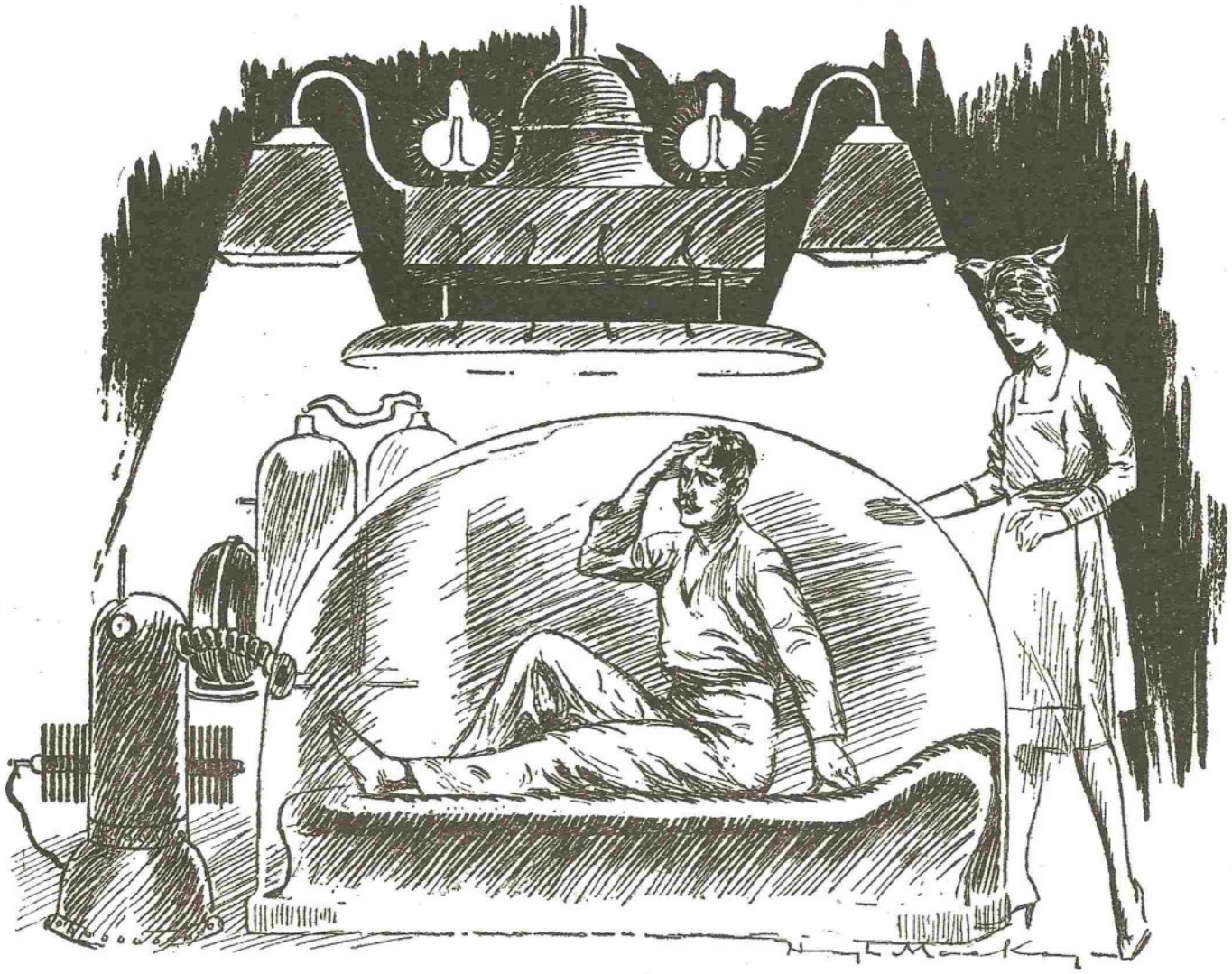
I went back to my room, wearied mentally as well as physically. The methods of diagnosis, treatment, and prevention that I had seen were far beyond anything I had ever dreamed of. They made my head swim. Furthermore, they made me realize that with all of my eleven years of elaborate training for the practice of medicine, I was here perfectly useless. My medical training, the most modern and up-to-date that I could get, made me about as valuable as a Kickapoo medicine man. I was useless and helpless, good only for common labor, in a civilization where medical and surgical operations were probably all done by machinery.

"Is our world as terrible as all that?" Miss Williams asked me, as I came into my room and threw myself on the bed. "Or were all of you so sad and gloomy all of the time?" She had a tray of food waiting for me.

I threw off my gloomy mood.

"Naturally, things are more complex now, and they confuse me," I explained. "I'll learn, and I'll get over it after a while. I just hope that you will continue to be kind and encouraging to me."

"I'll do everything I possibly can to make things easier for you," she said; and her eyes spoke more eloquently than her words, of the generous impulses in her warm little heart.



I lifted myself up to see what manner of instruments they might be, and found my head was tremendously heavy. There was a faint "clickety-click" among the instruments on the rod, and from the distance a gray-clad nurse sped toward me.

"I'm grateful to you," I said. "You can never know what your kindness means. With your sympathy, I can do anything. I can get anywhere." I held out my hand.

She looked at it for a moment, and then exclaimed:

"Oh, I know! We've all been studying the history of your times since you awoke. A handclasp meant friendship."

She gave me her hand, and something within me made me grip it hard and desperately. Then calmly I set about eating my supper.

While I was eating, Dr. Deland breezed in. It always seemed that he did things in a most undignified way for a man of his age and wisdom.

"You are well enough now," he announced, "so that it is not strictly necessary for you to be in a hospital.

My home is far enough away from here to get you out of the noise and pressure and confusion until you learn a little more about our ways. Come to my home with me; you shall live there as long as you wish; until you become established in Lincoln as a citizen."

CHAPTER V

The Ray

EAGERLY I anticipated my first venture into the streets, and I was quite excited when we stepped out of the hospital on our way to Dr. Deland's home. The street gave an impression of intense activity. The streams of people in variegated colors shooting swiftly past each other, the subdued rattle of the moving street, the rumble of the traffic from below, and the humming from the moving shapes in the sky, all made me feel rather uncomfortable. The people stepped deftly about the moving street from one section to another, but I came very near losing my balance when I stepped from the second to the third with Dr. Deland. After that I stepped so gingerly and balanced myself so carefully that people were inclined to turn and look at me. We rode a short distance, crossed the street by a graceful little archway overhead, and descended to the traffic level.

If it was uncomfortable above, it was doubly so here. The street was a wild torrent of huge, rumbling vehicles, which with the moving ways made such a din that we had to shout to each other to make our conversation heard. The dim daylight that filtered down through the translucent material of the moving street was reinforced by rows of big, white lights. I noted that the noise of the traffic was due far more to the heavy loads than to the operation of the machinery. Vehicles varied all the way from huge trucks hurtling like a house down the street on small, solid wheels, to swift, spidery passenger cars with wheels so big that they obscured the rest of the car.

We went into a garage for the doctor's car. He lived about twenty miles south of the hospital, and drove back and forth. It was a bright affair. It seemed to have been made of aluminum, with six-foot wheels and huge pneumatic tires. The body, with comfortable seats, was hung very low.

"Expensive toy," remarked Dr. Deland. "New solar power unit. Most of those cars"—waving his hand toward the traffic—"are run by cellulol, a distillate from the kashawa plant. But likely, in another generation all vehicles will be run by solar power."

As I was eager to see the machinery, he showed me a small box behind the seat. It contained a great many glowing white buttons on little partitions, and that was all.

"But the engine and the transmission? Where are they?" I gasped, having expected to see some wonderful refinements along those lines.

"I'll do my best when we have a little time," he replied, "to explain to you the principle of direct traction without the intervention of rotary motion. You wasted a lot of power that way in your day. But that is all the machinery there is in this car."

He drove out into the street, which was also divided into sections, the swiftest vehicles having the middle sections. We soon came out under the moving street and into the open. Here heavy trucks and freight vehicles were less numerous and swift passenger cars predominated. The sidewalks along both sides of the street were in motion. The buildings were not so high here as in the business portion of the city; they were loosely spaced and interspersed with lawns, trees, and flower gardens. This quarter contained mostly hotels and apartment buildings.

I could not help being impressed with the harmony in size, style, and arrangement of the buildings; a glance down the street revealed, not a row of individual buildings, but one beautifully consistent plan, into which each building fitted as an essential part.

"Let us stop," suggested the doctor, driving into the outer section, "while you look back."

The sight that met my eyes made me catch my breath. In the foreground were gardens and groves and palace-like buildings, as though taken from some fairyland city and set up on a stage. This spread in front of me for a mile, and out of it, like some towering mountain, rose the business district. First there was the outlying range of plain, massive buildings for storage and wholesale; then terrace upon terrace of increasing height, intricacy, and grandeur; here a row of immense domes; there a forest of little spires; toward the center the towering office and department buildings, and rising above it all, the white-and-gold tower of the Capitol building.

"What a city!" I sighed. "In my day men dreamed of such things, but did not consider them humanly possible. How does Lincoln rank among the cities of the United States?"

Dr. Deland smiled.

"Beautiful it is," he said. "It is widely famed for its beauty. But in size it is a mere country village. You shall soon see other cities, and you will find no two alike. You shall see Chicago, the many-storied city, where for a hundred square miles there are four, five, six layers of busy streets one above the other. You shall see New York, the city of magnificent heights; where there are offices, stores, and public assembling places hundreds of feet below the surface, in the rock; where there are viaducts connecting the floors of skyscrapers a thousand feet above the ground; where transportation in a vertical plane is as extensive and important as in a horizontal one. You will be interested in Rockafeller, Kansas, the 'artificial' industrial town that was built all at once like a single house; whose ground level is all free for traffic, whose rooms, offices, and inside spaces are all found above the level of the ground floor, while the roof of the city is one wonderful park."

In the meanwhile we slipped into the middle section, and I had a ride such as I had never had before. The surroundings melted into a blur, and I held on and gasped for air. The doctor leaned back nonchalantly at ease. In less than fifteen minutes from the time we had climbed into the car, we were at his home.

On the way I was able to note that homes fringed the highway from one to three deep, and the doctor told me that people drove as far as a hundred kilometers daily to their work. Behind the houses I could see growing fields; forest-like growths of the kashawa plants predominated. These grew from fifteen to twenty feet high every year, and from them was distilled a sort of fuel alcohol; also a paper was made from them, used for the manufacture of countless articles, including the clothes we wore.

I CANNOT remember everything connectedly. My next recollection is that of sitting at the doctor's dinner table with his family that evening. There were his wife and four children, and I was surprised when I heard that two daughters were married and not living at home. I had supposed that in this advanced era, I should find small families. The features of all of them were regular as models. I recollected the people I had seen in the streets. All of them had been perfectly proportioned in face and figure; they all had a freshness and vigor, their bodies were of a size and a power, and they moved with a robust buoyancy that was rare in my own day. There were no discrepancies in size, no cripples, no ugly faces. What had happened to change the human race thus, in such a short time?

Dinner had been ordered from the city by telephone; when the mistress of the house gave the signal that she was ready for it, a buzzer sounded and a circular panel in the wall opened with a swift rush like a powerful sigh; and from the opening a cylinder dropped into a padded basket, whereupon the panel clapped loudly shut. Out of this cylinder the dinner was put on the table.

Mrs. Deland beamed with happiness over her children. The eight-year-old boy was in uniform, and called himself an "Argonaut." This was a voluntary boys' movement which had for its object self-discipline in preparation for leadership in adult years. At this tender age, when children should have nothing on their minds other than care free play, this stern and implacable civilization was reaching down and beginning to mold their growing bodies and minds into slaves for its strenuous wheels.

The four-year-old boy was let very much alone to do as he pleased, but was talked to gravely and precisely, as though he were quite grown up. The twelve-year-old girl did not say much, but spent a good deal of her time buried in some kind of book.

The oldest girl present was sixteen. Her father pointed to a badge she wore, a cherub in blue.

"Estryn has just been rated, and received her badge yesterday. Blue is the highest color, and we are proud of her. She has chosen the vocation of motherhood. It is the most important one there is, and the integrity of our whole social structure depends upon it."

I was a little embarrassed, but the girl beamed happily. I finally ventured to ask:

"Has the bearing of children become a specialty, then?"

"Not the bearing, but the rearing. In practice it works out that the two coincide fairly closely. If a woman who does not have the motherhood training bears a child, she must give it up to be reared by properly trained persons; or she must take the seven years of motherhood training. If the State has already given her one vocation, the second must be at her own expense.

"In your day you did not educate your children. You sent them to school to get them out of your way. Then you slaved, paying for governments, insane asylums, wars, and courts, to patch up your original blunder. Today the State asks no other work of the mother than the training of her children. But that is so important, that in preparation for it, the State gives her a more accurate and through training than it does to any other class of producers.

"You lived about the time of the German War. Perhaps you were involved in it yourself. And you wondered if there would be any more wars. There were plenty more and greater ones, until man found out how simple and easy was the way out—not by ridiculously impotent peace congresses, but by *training the children.* Leblanc, the Bordelais, with his International Pedagogic League in 1999, stopped war, which a thousand silly peace congresses had failed to do.

"It was very fortunate that he came when he did, for the advance of science continued in spite of political stupidity; a few decades later the destruction of human life was made so easy by the discovery of new forces, that without the new education, civilization would have been totally wrecked in a short time."

He studied me a moment quizzically and then shook his head.

"Don't you see that?" he inquired. "Look. Under conditions of savagery and barbarism, it required a good deal of hard muscular work to kill a man; it was good exercise and was not so very dangerous. Today, the pressure of a button with a finger will kill a thousand or a hundred thousand men. Today it is so easy to kill a man secretly, safely, at a distance, that if men *wanted* to kill, all laws, all governments, all police would be powerless to detect the criminal or to keep order."

I thought a moment in silence.

"I've spent most of my time in thinking about the *saving* of human life," I remarked; "but it seemed to me that during my day the ultimate refinements in the destruction of human life had about been developed."

"Your developments were still very crude," he said with a smile; "today we have a dozen methods infinitely more terrible than anything you ever dreamed of. For instance one of the simplest is the form of radiant energy known as the Sigma Parabolic. Any elongated piece of iron-containing metal, slipped into any kind of wire coil or solenoid of fair inductive capacity, and wrapped in detractive such as is found on pocket telephones or flashlights, will electrocute a man at a thousand meters, instantly, silently, invisibly.

"With powers like that abroad, where would your unorganized, untrained, emotion-controlled civilization of the twentieth century be? It wouldn't be safe for a week. How can you control power like that, except by the most rigid training of the emotions from the earliest childhood?"

"If we had only had that thing in the Argonne!" I thought to myself. But fearing that the remark would be lost on the doctor, I refrained from saying it aloud.

CHAPTER VI

A Primitive Predicament

BUILT into the wall of their living-room was a cabinet affair with a ground-glass screen about a yard square. The family sat in the evening after dinner and watched a play that was being transmitted from a studio in the city. I derived a great deal of pleasure from watching the action in full colors on the screen and hearing the actors' voices and footsteps, and the sounds of their furniture and dishes. But I could not follow the play. It moved too rapidly for me and I soon gave it up. Dramatic technique must have changed radically, for the action to me was but a confusion and a babble and a running back and forth; I could make neither head nor tail of it. So I sat, watching the flickering, active, colored figures that talked and laughed and wept, and gave myself up to my own thoughts.

This was Sunday evening. I wondered if there were still churches. If so, the services could probably be transmitted over this "news-machine" as they called it. Perhaps that was all right if you got used to it; these people seemed to derive as much thrill from this play, as I had ever gotten in any theater on Randolph Street. In fact, they seemed a happy people; not only this family, but all the people I had seen. Among all of these uncanny mechanical things, the people lived a joyful, satisfied existence, if I could judge from their talk and from the gladness in their faces.

I suddenly realized that the play was over, and printed words were running over the screen: A catalogue of news events, plays, music, lectures, and all sorts of available entertainment, with figures for tuning into them. To please one of the boys, a sport event from the Gulf Coast was selected, and I was amazed to see a contest between sailing yachts, and a horse-race on the sandy beach. It gave me a curious comfort to think that horses still existed. Then there were pictures of jewels and women wearing them, a sort of "style show" from New York. The legend called them synthetic jewels, but they were more beautiful than anything I had ever seen. When the jewel picture was over, Dr. Deland's wife did a little tuning on the apparatus, and gave an order from where she sat to a dealer in New York, who assured her that the jewels would be delivered to her by pneumatic tube the following evening.

By bedtime my head was spinning from the marvels I had seen. In a pleasant little bedroom the doctor showed

me how to get my bed ready by opening a window and pulling a lever. The bed and bedding had been turned up on edge all day and hung out of doors; a single movement of the lever brought them in and arranged them for sleeping. And all of the housekeeping was patterned on this same plan. Walls, floor, and ceiling were hard and smooth, and what little cleaning they required was done by a compressed-air machine. There was a soothing absence of bric-a-brac and decorations. I was especially interested in the books in transparent, hermetically sealed cases, which could be opened by sliding a lever.

I cannot shake off the impression that I was at Dr. Deland's house for several weeks. As a matter of fact, I was there only one Sunday. Not that there was anything wrong with the hospitality of the family. Their treatment of me was certainly perfect in every psychological detail. In fact, as I recollect it, everything everybody did to me, during my stay in the Lincoln of the twenty-second century, was psychologically correct. Everybody did the reasonable, common-sense thing, which in the end was calculated to lead to the best practical results for all concerned. This contrasted strangely with some of the foolish, impulsive things that I did when I was there.

Dr. Deland's hospitality consisted in making me acquainted with his family and his home, and letting me alone to do as I pleased. The house was set in the middle of a couple of acres surrounded by hedges. Glimpses of other houses could be had through the foliage. A hundred yards back was the jungle of kashawa plants. Swift vehicles shot past along the road like streaks of lightning. Toward the west, one strange aerial vehicle after another sped by in the distance, all in the same direction. There lay one of the air-lanes. To the north lay the city.

I could see no hint or sign of it on the northern sky, but I felt it was there. I felt it was there so strongly that it ached. By the middle of Sunday forenoon I thought I would go mad. I walked about the grounds and gazed toward the north, and walked again. The strangeness of everything was uncomfortable and the inactivity was maddening. It would have been a welcome relief to have to work, to hunt for my living, or to fight for my life.

Even the girl's music failed to comfort me, though I remember it as something vastly stirring to the emotions; disquieting because I could not understand how it was produced nor what it was doing to me. Obviously, marvelous things had happened to music during two and a half centuries. I sat and watched her for a while, seated at a large keyed instrument; and then I fled outdoors.

I wanted to be doing something. I wanted to be working.

At least, that is what I thought at the time. Now, as I look back, I realize quite frankly that work was not really what I wanted. I did not understand then that work merely symbolized a method of getting back to the only girl who had ever caused me to look a second time at her. I only knew that I was very lonesome and very miserable. If I insisted on working, they would have to put me to work around a hospital, because that was the only thing I was good for. As there was only one hospital in this "district," that meant that I would again be near the brown-eyed nurse, who could understand me and sympathize with my plight. All this hospitality, all these marvels meant nothing to me. I wanted to be near her and hear her voice. I longed desperately to be at the hospital. I tramped savagely around on the velvety grass; I wanted to be at the hospital.

AT noon I told the doctor that I could not bear longer to presume on his kind hospitality; that I was ashamed of myself for permitting someone to support me when I was able and should be doing something useful; that I was eager to assume responsibility for myself and get at some kind of work. He pondered thoughtfully over what I had said and assured me that I was most welcome in his house; and that, if he were in my place, he would not miss the opportunity to relax a while and take things easy. Life was strenuous enough anyway.

In the afternoon I stood and gazed up the road to the north. I was restless and miserable. I didn't belong among these people. They seemed to enjoy this world and this life, but they were made of different stuff; human nature must have changed. There was more intellect, less emotion. I didn't see how I could stand it here.

I walked down the lane between the adjacent grounds, to the east where I could see the gleaming kashawa leaves in the distance. The dark glossy green of the leaves and the cool depths of the thicket looked comforting. As I approached it, the thicket loomed high like a forest, a wall twenty feet high, of rich green, interlaced with the reddish tinge of the stalks. The leaves looked like the leaves of the castor-bean plant, but they grew on huge, branching stalks as thick as my arm. I walked in under them.

The cool, mysterious depths of the thicket attracted me. The ground was soft and perfectly clear of any undergrowth. I wandered on into the pleasant twilight, for the sky was completely obscured by the big leaves. I found a sort of exhilarating comfort in the presence of the green things, and a satisfaction in the physical exertion of walking briskly ahead. My strength was returning rapidly and it felt good to be moving.

I swung onward, feeling rather more cheerful than I had since morning, now dodging a low branch, now pushing aside a leaf that hung in my face, and really finding some hope for myself in this amazing world. I wonder if I am the only one so constituted as to be depressed when in the midst of nothing but masonry and machinery, and instantly cheered in the presence of Nature and her handiwork? Can man ever get completely away from his dependence on green things, both for mental and physical sustenance? I wondered, and felt grateful for this opportunity, after my recent experiences. Perhaps, if I could get out occasionally into a wilderness like this, I might endure life in this world of marvelous machines and still more marvelous human relationships.

The human relationships were indeed more marvelous than the machines. For, the Sigma Parabolic Ray came into my mind. Think of it! A world at the mercy of any man who chose to destroy it, and yet human nature was so trained that the world was perfectly safe!

A faint aromatic fragrance hung on the air, vaguely suggestive of cinnamon. I surmised that the plants smelled that way; but I enjoyed the exhilaration of a swinging, uninterrupted walk so thoroughly, that I postponed making sure. It had been a long time since I had stretched my legs so lustily. Finally, after I had been going at a good gait for some ten minutes, I stopped and broke off a leaf. The aromatic odor of the broken off portion was quite strong and suggested cinnamon. The stem of the leaf was dry and pithy, like a cornstalk or an elder branch. I looked about me. Far into the distance stretched the vistas of crooked, branching stalks, fading into dimness, a soft, confused dimness in the distance. A faint rustling came down from the tops, but down here it was still. Not a glimpse of daylight anywhere.

Regretfully I started back.

I walked along in a pleasant frame of mind, cheered up by my contact with Nature. Almost gaily, I traversed miles and miles of forest. It was some time before it dawned on me that my return trip was taking longer than the journey inward had required. And still there was no daylight, no visible sign of the open ahead of me.

I stopped, and a sinking sensation swept over me.

I was overwhelmed with the realization that I had carelessly plunged into this unmarked jungle and was lost.

CHAPTER VII

Man-Hunt by Science

"I'M sure I did not walk directly away from the edge," I thought to myself. "I must have walked more or less parallel to it. So, if I go at right angles to my present course, I ought to find the edge."

I set off at right angles to the course I had just followed; but it was a hopeless feeling. Which was right angles? Already I was not sure just which way I had come last. All directions looked alike among these crooked stalks. And I was beginning to feel fatigue. After all, I had not yet gotten back my normal strength and endurance. For a while my momentum carried me on, and then I sat down to rest.

The ground was soft and the air was warm, almost hot. I noted that clothes were lighter than the clothes that had been worn in my time. Had the climate become warmer then? It seemed that to grow this luxuriant profusion, an almost tropical climate would be necessary. I recollected a statement I had once heard that the carboniferous era was possessed of a warm climate because of the high percentage of carbon dioxide in the air, which prevented heat loss from the earth's surface. When the luxuriant vegetation of that period had fixed the carbon of the carbon dioxide into its carbohydrate molecule, the weather had become cooler. But now that during the two hundred and fifty years of my anesthesia, immense quantities of carbon dioxide had been returned to the atmosphere by the combustion of carbon fuels, its percentage in the air must again be sensibly higher, and the sun's heat must be more readily retained therefore.

However, a little panicky feeling began to steal over me. Just how serious was it to be lost in this jungle? The idea struck me that I might orient myself by climbing one of these trees. They did not look very strong, but I was desperate. I put my foot in a crotch and tried to raise myself up. The branch broke flimsily off at once; it could not support a tenth of my weight.

I tried again. I broke off all the branches around the big main trunk and tried to climb that. It was six inches through and looked as though it ought to be strong enough to support me. But I was not two feet off the ground before it collapsed with me.

I sat down again. Certainly, this field could not be limitless. No matter in which direction I went, if I kept on I ought to come out somewhere; somewhere where there were people. And people would help me get back to Dr. Deland's house. I leaped up and started out energetically, for this place might be several miles long and I might be setting out along its longest diameter. I would have to hurry to get out before night overtook me. Already I could imagine darkness, hunger, and thirst overtaking me.

Desperation drove me on in spite of leaden feet and a certain difficulty in getting my breath. The monotony of the endless repetition of crooked branches was deadening. The reddish stalks and dark green leaves began to numb my brain into a kind of coma. But I pushed doggedly on, confident that if I kept at it I must perforce emerge somewhere in the open. Then I would have no real difficulty in getting back to Dr. Deland's house. The fact that I had no sort of money with me to pay transportation worried me for a moment, but not seriously. I kept hurrying forward, past the forked arms of the trees; and in the dim distance the crooked tracery hurried along with me. It began to seem that I had been plodding through this endless jungle for hours and days.

Then I came upon the broken tree. There were the branches I had broken off, the trunk that had collapsed with me, my footsteps in the soft earth, and the mark on the ground where I had rested. I had simply traveled in a circle!

I dropped to the ground in dumb despair. My mental state was so curious that I remember it to this date. On the whole I cared little whether I lived or died. Only when I thought of the gray-clad nurse, I felt a little pang of regret. But this world was no place for me, and what was the difference? But—to survive so miraculously for two and a half centuries, to see marvels undreamed of during my time—and then to perish of hunger and thirst in a jungle! I was disgusted. The ignominy of it! To be ground in some huge machine, to be crashed in a flyer high in the air, to be annihilated by some strange ray—that would have satisfied me. But to get blunderingly lost and die this way was too disgustingly primitive. That belonged to the Stone Age. Again I jumped to my feet, determined to find my way out somehow. The human mind is a queer bit of apparatus.

But I didn't get far. A pleasant sort of lassitude began to steal through my limbs. After all, my feelings of hunger and thirst had been imaginary. It had been only a short time since I'd had a good meal; and since then I had walked briskly and gotten tired. The weather was warm. Before I realized it, I had slipped to the ground and dropped off to sleep.

* * * *

"OUGHT to be near here somewhere," said a brisk, muffled voice. I awoke, rubbed my eyes, and stretched my stiff limbs. It was pitch dark.

"Let's sit down here. I want to check my figures," said another voice. In a moment it continued:

"It can't be far. Two graph lines from the microphone direction-finder cross at this spot. We stopped the car right over the indicated spot, and there it hangs, square above us. I checked on three leads, his watch-tick, his heart-beat, and his breath-sounds; and they all agree. He must be within the radius of a dozen feet of where we sit; and he must be still alive, though probably unconscious. The galvanometer deflections are feeble, but steady.

"The carbon dioxide column is the most accurate. Through the oxygen exhaled by all these plants, the carbon dioxide exhaled by a human being is plainly visible in the spectrophotoscope; and just before dark we located that in the middle of this square. He's bound to be near by."

A bright light swept about, throwing a few crooked trunks into bright relief against the black background. I sat up, the significance of the words penetrating slowly into my dazed consciousness. They had located me by some very refined scientific methods. I staggered to my feet and went toward the source of the light.

"See!" said one of the dark figures with calm satisfaction, and in a moment the other was talking into a telephone.

Then there was a rustling among the leaves; a light was directed up in that direction, and there was Dr. Deland climbing down a rope ladder. I apologized shamefacedly.

"I'm afraid I'm hard to take care of," I said.

"Small matter," said one of the engineers succinctly. "Glad to have the problem."

I climbed up the swaying ladder behind them, into the car of the airship, and a few moments later was lowered into Dr. Deland's front yard.

"I've been thinking all afternoon," the doctor said at the dinner table. "You are anxious to work. I must confess that your attitude puzzles me. Knowing that you might possibly awaken during my lifetime I have studied the history of your era closely. I did not gather from my study that it was psychologically possible for a person of your century to realize so powerfully the duty of the indi-

vidual to the State. Every epoch has its psychological characteristics, which are with difficulty comprehended by the people of other epochs. A strong feeling for individual personal liberty, political and economical, was the psychic expression of your age, whereas the individual's obligation to the State is our own.

"However, it is probable that each epoch contains a few individuals who feel and live ahead of their time. We had intended handling you with consideration for the psychology of your own day; but we shall be only too happy to realize that you are one of us and to treat you as a modern citizen.

"Giving you immediate productive work was at first not an easy question. You must realize that to-day every job is highly specialized, and the man who does it must be carefully trained for it. With all your education, it would take you at least a year to train into the easiest position we have to offer. But, a happy inspiration came to me. You can step into real work at once."

He beamed at me as though he had accomplished a real triumph. I was glad. It would be gratifying to be able to work and to be somebody among these people. Only for a moment I permitted my thoughts to dwell delightfully on the nurse. Soon I would see her; now I must listen to the doctor. He continued:

"You have an untold advantage over the best of our historians. You have first-hand knowledge of men, places, and events of your day, that will be of immense value to us; and among historians you will be looked up to and sought after. I talked to several of them this afternoon.

"They will want you to give a complete systematic account of everything you can remember of your times, for their records. That will probably take many months. In the meanwhile you can be rated and your aptitudes determined so that you will know for what vocation you are most fitted and begin to train for it.

"You will be given apartments at the University, and can live right there with your work. To-morrow morning I shall take you there."

CHAPTER VIII.

Out of Patience

"THERE is one little inconvenience that will be imposed on you as a penalty for having gotten into affairs," Dr. Deland said to me as we sped toward the soaring skyline of the dazzling city on Monday morning. I wondered if he noticed my lack of genuine enthusiasm over my prospective job. I was rather annoyed at my own reaction to the matter. I had expected that a real job would make me feel better, but I only found myself constantly wondering how far it was from the University to the hospital.

"As long as you were at the hospital or at my home, it was possible for you to remain in retirement. But arranging for a place for you at the University and for an apartment for you to live in, involved publicity. The news is out. The public wants to see and hear you; and before going to the University you will have to appear on the news screen and say a few words to the world. You are a very famous person. Do you mind?"

"I suppose not," I answered. I had never thought about such a thing. As a matter of fact it was just a little thrilling to think that I would appear before millions of people all over the world.

Into the roaring depths of the tunnel under the clattering moving ways the doctor's big-wheeled car carried us; and the city closed over our heads. Countless passenger cars were streaming in from the country, outnumbering the heavy traffic at this time of the day, for people were swarming in to their work. Up on the upper street we found the noise of the machinery less obtrusive; faces were fresh and cheerful in the morning air, and the slanting sun shone brilliant on the dress of many colors. Especially the faces! They showed a uniformity and symmetry, a refinement that puzzled me. Had this somehow become a perfect human race?

Under a huge arched doorway, through a magnificent lobby, down a vast corridor, and into a richly appointed broadcasting studio the doctor led me. There, an unbelievably active man was waiting for us. He seemed to sense our coming before we had stepped out of the elevator; as he waited in his open door his personality raced down the hallway to meet us and expanded about us and whirled us away. He welcomed me, asked me a hundred questions, led me in, explained the broadcasting machine, and told me what to do and how to do it, all at the same time. He was all around the room in a twinkling; he gestured, chiefly with his fingers; he talked at a prodigious speed far past my ability to understand him. He was an official high up in the news organization, and I was being highly honored to receive his personal attention.

I stood in front of the lenses with the bright light on me, and he pirouetted among the tubes, smiling and frowning and gesticulating at me to coach me into proper attitudes and expressions. For an instant he shut off the machine.

"Remember! Millions are watching you!" he hissed. I looked about the little room, hung with brown draperies, and at the blank lenses. The whole business looked a little foolish.

"Now tell them how it felt to wake up among us!"

I did my best at that, feeling very silly.

"Now, then, about your wanting to have work to do as soon as possible!"

I felt my face flush hot at this, and turned on him resentfully. This was getting personal. But he pranced up and down before me, out of range of the lenses, with a frantic expression on his face; he was suffering for all those millions of news subscribers. I stated briefly that I wanted to be a citizen on equal footing with the rest, and wanted to earn my privileges.

"Now promise them that to-morrow you will tell them about the 'radio' and the automobiles of the twentieth century."

If I could have reached him, I would have driven my fist into his face. He acted as though I were his personal property, and as though he were entitled to make a puppet out of me and my feelings as much as he pleased. I gritted my teeth and said what he asked me to. He shut the light off and in a moment was gone. I had a recollection of him bobbing up and down in a flash of thanks, and he was gone, while I stood there gasping.

"Brrrr!" I was clenching my fists and gritting my teeth to hold myself in. I came near saying some worse things than that; only there stood the kindly old Dr. Deland, looking at me with a somewhat puzzled expression on his face.

"Now to the University!" groaned my inward consciousness. Outwardly I said nothing. During my twentieth century life I had known people who wished that they could be living this far into the future. With all my power I wished I had them here to exchange places with.

WHY dwell on the details of my tedious experiences at the University? It depresses me to think of them. I had thought I would see classes of young people eagerly watching me, as I talked to them of olden times; I had hoped for appreciation in the faces of listeners, I had hoped to read their enthusiasm in their faces and to answer their interested questions.

Instead, I talked into a machine. For three days I sat alone in a small room, and talked to a machine, and then it became more than I could stand. By the end

of the first day they had delivered to me a complete outline of everything they wanted me to talk about; I got a big printed book of a thousand pages. On the third day I was a quarter of the way down the first page of phonetic letters.

The machine had a microphone, and vacuum tubes could be seen when a lid was raised; a strip of tape ran through it, and I could turn switches to certain buttons and hear my voice telling me back the things I had said. For my own voice, it seemed to have a droning, melancholy quality to it.

I could not use the drawing machine, though it was easy enough to operate; keys with the names of objects and relationships on them were set like the keys of an adding machine; then the motor was started and in a few minutes the finished sketch came out. But my drawings all turned out to be twenty-second century scenes, objects, and people. However, as I command a pencil fairly well myself, I amused myself by illustrating some of my remarks with my own hand.

There were two more visits to the news studio. The next day I said a few superficial, sketchy things about my own age two and a half centuries back. The combination of human dynamo and jumping-jack was not there that day, and I went mechanically through what was asked of me by a courteous, but very young attendant. Apparently the results were disappointing to the world audiences, for on the third morning the dapper, chattering whirligig of a man was back. He smiled at me and stroked my shoulder; in fact, he twisted me around his finger. He had me acting like a monkey before the lenses just by the strength of his personality.

That evening I sat in my beautiful but lonely apartment at the University, trying to relax after the day's struggle with the dictation of history. It occurred to me to switch on the "news-machine." There I saw myself on the glass, with a sickly smile, and saying in a simpering voice:

"I am asked to tell what effect your modern age produces upon me; I am asked to give purely personal impressions. I must confess that while the mechanical developments that I see about me amaze me very much, it is the differences in people that really seem most profound to me. Such perfect health and comely personal appearance, such logical behavior; so little illness; such placid smoothness in the operation of everything; such an absence of friction between individuals and organizations ———it seems to be a world where reason reigns.

"And yet I miss something here. Why does everyone and everything seem so mechanical to me? Why is there such a lack of human warmth? Is it because human emotion is so thoroughly repressed among you? I feel very much alone in this world. The nearest one of you seems a thousand miles away———"

I sat there watching the glass and listening to the sound of my own voice, aghast. Is that what I had said this morning, under the influence of that gibbering little demon?

"I long for human nearness that meant so much in our day, even though our civilization was crude———"

What a fool I had been to lay my heart out on a platter before the gaping multitude! Usually I am retiring and secretive. I was horrified.

"It seems that somewhere in this world there ought to be an answering throb of emotion to the vast desolation that I feel———"

Had I actually said that? Cold shivers went up and down my spine. What business had that prying little mannikin to lay bare my innermost secrets this way? Now everybody knew just how I felt. They could probably guess a hundred times more than my words really said. I paced across the room, and then aimed a vicious kick at myself on the news glass. It shattered, and the pieces tinkled to the floor. My voice suddenly stopped.

"Damn!" I said to myself, and went to bed. It was hours before I could go to sleep.

In the morning I refused to accompany the young attendant who came to conduct me to the news studio.

"Tell them I'm fed up on broadcasting!" I said and shut the door.

Within ten minutes Dr. Deland came in.

"How do you feel?" he asked.

Just in that same tone of voice we used to speak to the patients at the psycopathic ward of the Cook County Hospital in Chicago.

"I'm not going to broadcast," I said, standing in the middle of the floor.

"Would you rather go to the hospital with me?" he asked kindly, it almost seemed sympathetically.

My knees almost gave way under me.

"Yes!" I gasped.

CHAPTER IX

I Am a Puzzle

IN the door of the little green room at the hospital stood Elite Williams, smiling. From the way she held out her hand to me, I fancied that perhaps she, too, was glad to see me.

"Why shouldn't I be glad to see you? I've taken care of you for two years."

Again amazement held me. I exclaimed:

"You don't mean to tell me that you people have learned to read each other's mind? Scientific views in my day held that such a thing was not possible and could never be possible—thoughts are the functioning of a mechanism, and do not have a concrete existence that can be transferred to or perceived by others."

She laughed at my astonishment and explained:

"No. Thought reading and thought transference have not been found possible. But we can interpret your postures, actions, and expressions, and deduce your thoughts from them. The people in your day must have been very *naive;* it is easy to tell what you are thinking."

"Well," I said, "I am glad that you know all about it, then. You do not seem to mind. If you did, this would be a terrifyingly confusing and lonesome world."

I do not know just what I might not have said or done next, had not Dr. Deland come into the room.

"Would you mind going through a diagnostic examination?" he asked, looking at me oddly, as though he expected that I would object.

"No," I replied. "I rather think I should be very much interested in the procedure. But why?"

"We all take them periodically; and you would have to eventually. But the request comes just now because your behavior shows some unstable deviations, and it is possible that some physical basis may be found for them."

I appreciated his frankness and told him so. Often since then I have thought about his perplexity over my behavior. Here was an era which understood psychology well enough to train people to live together in peace and harmony, and to keep a civilization stable and orderly, though one man by the touch of a button could wreck it flat. Here were people who could look at me and tell what I was thinking about. And yet they did not fathom what was the matter with me. My simple, old-fashioned mother would have recognized my trouble from its symptoms, at once.

Of course, at that time I had no idea what the trouble was myself. Now that I look back, it is all plain enough. But, I had never been in love before. All I knew was that I wanted to be near the hospital; and that I was miserable and unhappy at all times except when I was in *her* smiling and sympathetic presence. After all, far more foolish things than any I ever did have been com-

mitted by young fellows who were upset about a girl. My behavior merely looked so terrible to them, far more terrible than I realized, because it contrasted so diametrically with that of a whole race who never did such things. Why couldn't they tell by their thought-interpretation process that I was in love? Because they did not fall in love, and did not know what such a thing was?

While I waited alone in the green room, to be sent for and examined, I turned on the news-machine. The current news had no pictures; a voice was talking:

"The Sleeper acts strangely.

"Something is wrong with him.

"What shall be done with him?

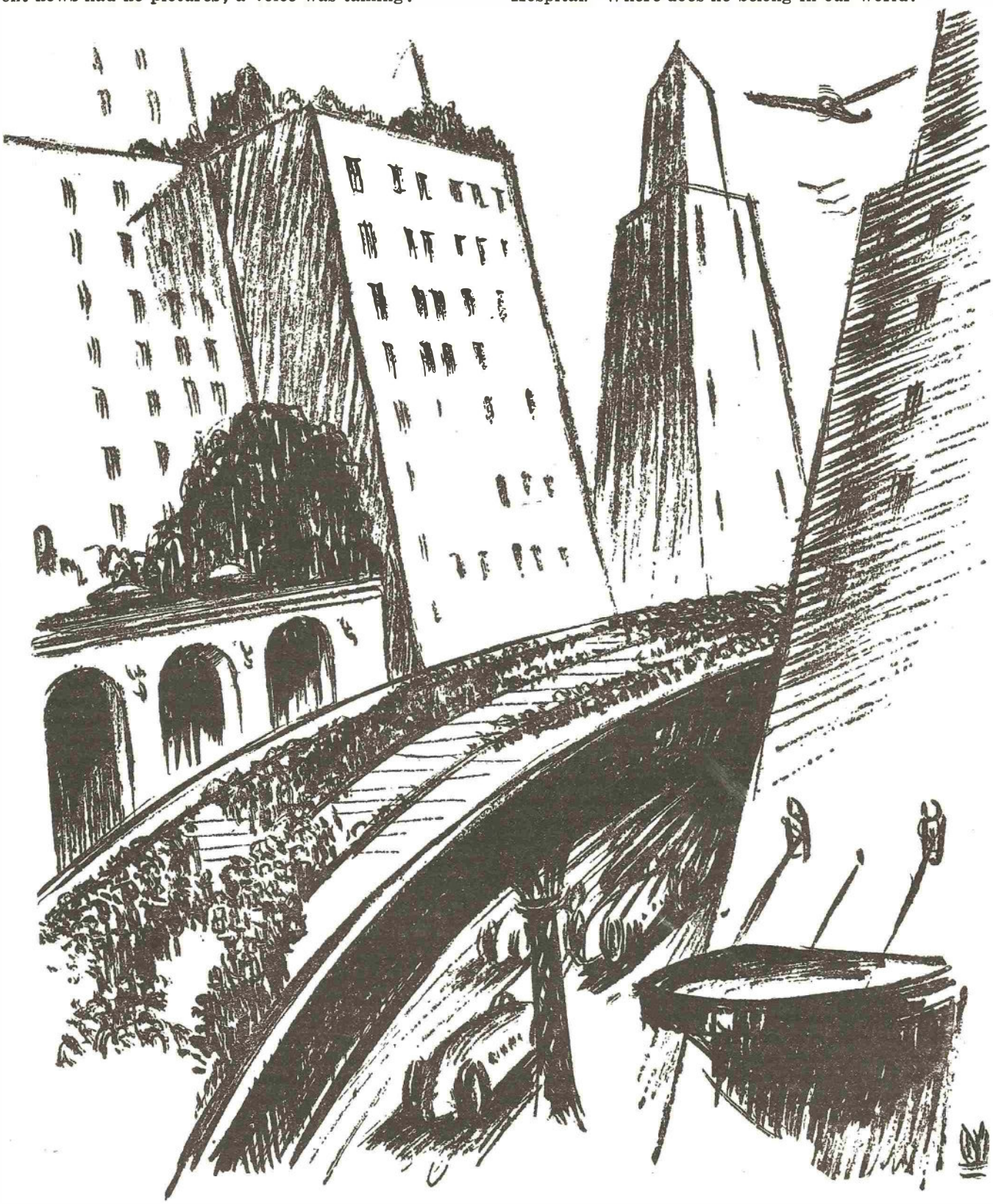
"He wanted to produce, but broke down.

"He wrecked a news machine; was it a fit of illness?

"Is he sick? Or retrovert? Is it possible for a human mind to cross two centuries successfully?

"If it is not possible, what then?

"He has just consented to be examined at the Lancaster Hospital. Where does he belong in our world?"



"Where is the traffic?" I asked, though it was long before I could speak. "I see only people on foot." "Below," he replied. "The street is two-storied here."

The melodramatic hiss ended, and there began a report in a deep voice, regarding the course of a moon-projectile. But, intensely interesting as that ought to have been to me, I could not get my mind on it. Evidently these people were taking me seriously. Why? What could I mean to the world, except as an object of curiosity? For a long time I sat in a deep study, until Dr. Deland's voice brought me out of it.

"Medical men of your day," he explained, as I went with him to the diagnostic laboratories, "made their diagnoses by symptoms and on the basis of post-mortem pathology. They had not yet learned that disease is not a thing *per se*, but merely the visible result of an individual body not properly adapted to its environment. We do not try to know disease, but rather to find the mal-adaptation. This is the Barkeley Intonator, and determines the proprioceptive index——"

A NURSE was already strapping pads to my wrists; a mellow little gong began to strike. While the nurse watched a couple of dials, a transparent tape ran out of the machine into her hand, giving the machine's verdict on me. Out of that I was put on a delicately balanced beam in a dark room, and beams of light cut the blackness about me. The doctor explained that a tracing of my parasympathetic functions was being made. I had stuff injected into a vein and stood before the X-ray, and saw it darken through my lungs. Efficiency curves of the heart, lungs, cerebellum, stomach, and what else I don't remember, were run out on kymographs as I went through one machine after another. The doctor kept explaining what each one did and what the result signified, but I gave up trying to comprehend it.

When they got through, they knew me piece by piece; they knew what each piece could do and whether it was any good or not, and how all the pieces went together. I felt like a watch that a jeweler has taken to pieces and put together again. I was stunned by it all; I was thrice discomfited because of the excellent medical education I had had in my day, for I could make neither head nor tail of any of the things they had done with me.

When they were all through they gave me a clear ticket. They found no fault or flaw in my physical structure nor in any of my functional activities. If I knew anything about reading faces myself, I recognized that they were more puzzled when they got through examining me than they had been when they began. Obviously I was as amazing to this world as this world was to me.

It was hard for me to realize, and it will be hard for my reader to realize how strange and puzzling the situation was to the twenty-second century people. To have somebody suddenly refuse to do a very obvious thing like broadcasting; to have him get a fit and smash up a news-machine! In our twentieth century, those things happen every day. Misfits and maladaptations are common. But the twenty-second century had eliminated these things and had forgotten that they ever existed. Therefore, they could not understand me. Only a few scientists understood me in the abstract.

"Now do I go back to the history department?" I asked.

"You are interested in finishing that work?" Dr. Deland hung on my answer as though some momentous decision rested upon it.

"If it's any good to anybody, I'm grateful that I'm able to do it," I said, dumbly realizing that I wasn't good for anything else around this city.

"To-morrow you may work on your history. To-day, go outdoors and look about the city. After this I shall be careful about letting you stay alone as much as I did. I think that we of the present time are more accustomed to working in solitude and to concentrating intensely than were people during your time."

"I'm sure I don't know what the trouble is," I replied; "but it seems that everything I try here is a failure."

As a result of the fact that I was assigned to "productive" work, I now had a supply of "checks," which were square pieces of stamped metal foil of different sizes. With money in my pocket and an afternoon of liberty, I felt like a schoolboy on a holiday. I started out into the street for the first time alone, more buoyant and elated than I had felt at any time since my awakening. I walked out of the hospital, my heart pounding like a big machine.

I felt a sort of secret regret that I could not have Elite Williams with me. The idea of having her along with me to show me things was a delightful one to play with. I had almost asked her to go; I had cautiously approached the matter by telling her of my plans for the afternoon and asking for suggestions as to where to go and what to see. Then I sort of lost courage and decided to play the game more slowly, and to say nothing at this particular time. For some minutes I listened to her enthusiastic suggestions as to what I ought to see. Her eagerness to be helpful made my whole world seem more rosy and bright. Then I held out my hand to her again. She took it like a person playing a game. Evidently shaking hands was not a custom of this day, and she was merely humoring me. But I seized every opportunity to feel that soft, firm touch of hers.

I went out of the door with a smile in my eyes and a springy lightness in my step. Dr. Deland's face was a picture of perplexity as he wished me a pleasant afternoon.

CHAPTER X

Disaster

OUT in the street, I found a glass roof spreading above me, and rain hammering on the top of it. From wall to wall it stretched, and under it everyone was dry and comfortable. As it had not been there before, I judged that it must be the same elastic, transparent membrane which had covered me when I awoke, and that it was put up on occasions of rain only. I wandered about aimlessly and rode this way and that on the moving ways. But gradually my mind settled on an idea about which it had been hovering for several days.

When Dr. Deland had spoken about the Sigma Parabolic Ray, that could be generated almost with bare hands, he had spoken of pocket telephones and flashlights. I wanted to see one of these. I decided on the flashlight; probably it would be simpler and easier to understand than a telephone. The obvious thing would have been for me to ask Dr. Deland or Elite Williams, or almost anyone, to show me one of the things and explain it. But, I had a powerful curiosity to see how much of it I could understand and figure out alone. Likewise I had a strange constraint in revealing my curiosity about anything connected with that terrible ray. Suppose they suspected me, untrained as I was in their preventive psychology, of trying to tinker with the ray?

I hunted around considerably before I found what I wanted, but no one seemed to notice me or pay any attention to me. I got into what seemed to be a bank, where they were handling large quantities of the metal-foil script; I tried another place and found it an immense dining-room, and for a while watched fascinatedly how food appeared in openings in the walls next the tables, and how people worked keyboards to order their food. I found several places with merchandise of various kinds, before I eventually got into the place with many polished metal things, telephones, fans, gongs, mostly things I didn't understand. With some trepidation I asked a floor-walker sort of person, who seemed to have nothing to do,

how to purchase a flashlight. Very courteously and without hesitation, he helped me purchase it by means of the keyboard and slot; and he showed me how to use it. I judged that he recognized me, but was too courteous to show it.

The glittering little thing gave an intense light without any heat; and the energy for the light was not carried in the flashlight at all, but was drawn by the "detractive" covering from the supplies of energy constantly broadcast into the ether for public use. The purchase of the little trinket gave me such satisfaction, that I decided to go back to the hospital, having seen and experienced enough to satisfy my curiosity for the present.

Then I got the idea that I wanted another look at the traffic below the moving street, and I descended again into the uproar of the lower story. The ceaseless, roaring stream of strangely-shaped, thundering vehicles aroused in me the same emotions as the never-ending plunge and roar of a waterfall, or the beating of the sea. Where did it all come from? Where was it all going? Did it never end?

Some of the conveyances carried tremendous loads. To see twenty or thirty tons hurtling along the street on a truck made me wonder what the pavement was made of to stand such punishment. The smooth, glassy paving material was a puzzle to me. It was very hard and flinty, and yet looked as though it had been melted and poured in place; for there were neither blocks of it nor joints in it.

EVERYWHERE there were machines. Machines carried goods, swiftly and slowly. Machines loaded and unloaded. In one place a machine was tearing up irregular blocks of pavement and digging a hole; in another place a machine was swiftly erecting a scaffolding. Huge machines whose purpose I could not guess went by, or stood in corners and clanked and roared, and swung things around. And in each machine was a human being who guided and controlled its actions; each one of those grimy, hurtling, clattering things held a man. After all, this great, feverish uproar was not some great bedlam of natural forces—it was the activity of men's brains. I caught glimpses of several of the men in the machines, young, with unshaved cheeks and a sweaty lock of hair hanging over the forehead and shirt open at the neck. While his machine performed herculean tasks, was the real attention of each of these young fellows occupied by the girl whom he would see that evening after working hours?

Near me, a truck was unloading huge rolls that looked as though they might be paper. Through the window of the building I could see strange mechanisms, and I was fascinated by their operation. I moved closer to watch them. An apparently solid rod reached repeatedly forth. bent itself into a hook, picked up a package, and straightened out again to let the package drop into the machine. It worked like a cat's tail or an elephant's trunk, and conveyed an uncanny sensation that it might be alive. A line of gears, without axles or any support or connection other than their intermeshing teeth, rotated busily against each other, and the line bent and swayed, but held intact. Strangest of all were two connecting-rods that crossed each other's paths at right angles. They must have had some intricate way of passing each other, but to me, look as long and closely as I might, it looked plainly and clearly as though one rod went right through the other each time they went around. The whole thing looked more like a session in prestidigitation than like watching real machinery.

I suppose I stood at that window for a half an hour, absorbed in watching those impossible things working away quietly and steadily. For the time I forgot the roaring pandemonium behind me. I had had the impression that I was standing in a safe place, next to the building, thinking that such pedestrians as came down there, used this as a sidewalk. To this day I do not know exactly what the rule was on that point; but evidently I was wrong in my surmise.

Suddenly a huge vehicle loaded with long poles that projected several yards behind it, thundered by so close, that for a moment I thought I was going to be ground under its wheels. I breathed with relief as it passed; and determined to get out of there. Just as it passed me, the truck swerved, and one of the poles or pipes hit me a sickening crack in the head. It seemed to shake my eyes loose and sent a singing through my ears. My knees slowly crumpled under me, and I went down on the pavement. I yelled in suddenly revived terror as another towering truck passed within a hair's breadth of me. Not till it had passed did I notice that its broad wheel had passed over my right leg, crushing it to a thin layer of bloody pulp from the knee down.

I had the presence of mind to grasp my thigh in my two hands and stop the torrent of blood that poured from the severed arteries. Then, a sinking, sickening realization went through my mind. Already practically useless in this terrifying world, I was now in addition to be a cripple—among all of these busy, hustling, efficent people—among all these physically perfect people—a one-legged man was to go back to Elite Williams. I grew so violently discouraged that I relaxed my grip on my thigh, determined to allow myself to bleed to death and be done with it.

By that time a shouting had arisen. People were running toward me and a bell was clanging.

"It's the yipe that slept!" I heard someone shout.

Then I grew so swiftly weak that everything became blank, and I was glad it was all over.

CHAPTER XI

Miracles

THERE was a long, comfortable period of emptiness. It felt so pleasant that when things began to come back to me, I was irritated: Bauer and his anesthetic, my infected finger, then the wonderful new Lincoln. Then my leg crushed to a pulp on the street, and I groaned.

"Are you awake?" asked a soft, familiar voice.

I opened my eyes and groaned again. I was in my little green room, and my nurse was busy with the strange apparatus it contained.

"Physically I am very comfortable. My pain is all mental. I wish they had let me die!"

She stood a moment, and then smiled.

"You're a wonderful pessimist. *I* am glad that you are alive and well, very glad!"

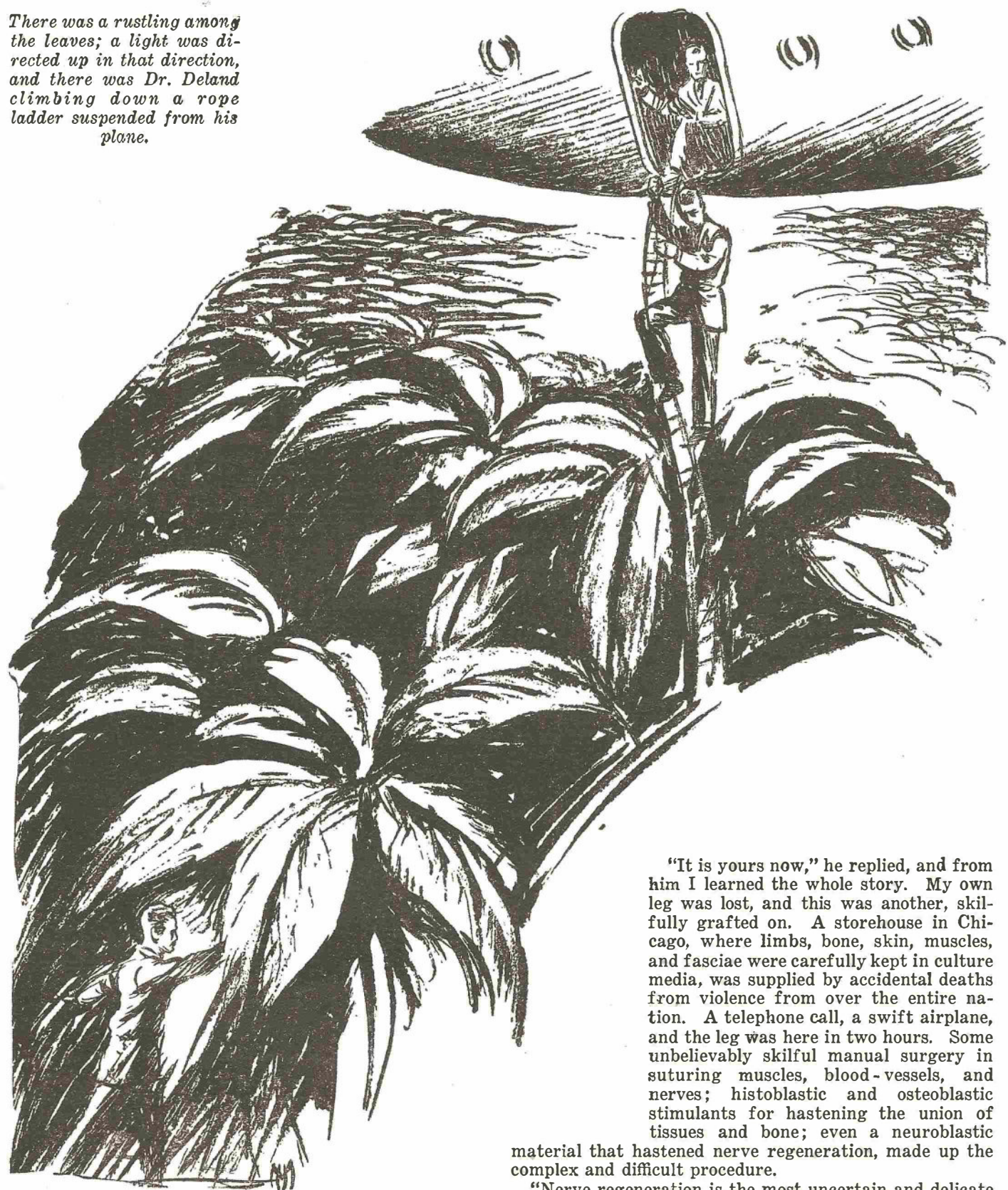
"Now, look here!" I exclaimed. "You've been kind to me, and I think you're an angel and a noble girl. But you cannot afford to let yourself become involved with a cripple, who would be useless even if he weren't a cripple. I am crazy about you, but I can't stand for that."

She looked at me perplexedly for a moment. There certainly was a definite difference in the English speech of this epoch and mine. Suddenly a light seemed to break over her, and she threw back her head with a little birdlike:

"Oh!"

She came up to the bed and threw off the cover. I stared down at myself, stunned out of speech. What I expected to see, I don't know. What I did see was that I had two good legs and feet. There was a surgical dressing around the middle of my right thigh.

I continued to stare blankly for some minutes, wondering if I had merely had a nightmare about having been



There was a rustling among the leaves; a light was directed up in that direction, and there was Dr. Deland climbing down a rope ladder suspended from his plane.

run over on the lower traffic level. But gradually it dawned on my perceptions that my right foot and leg were not my own. They were larger and darker-skinned than my left, and the toe-nails were rounder. I pinched the strange leg, and could feel the pinch; the sensation was acute enough, but localized only vaguely. I tried to move it, and succeeded, though it required great mental effort, and the movement was not what I had intended. I don't know how long I stared at my legs in silent surprise; when I looked up, Dr. Deland stood there, smiling kindly.

"Is it or isn't it mine?" I demanded.

"It is yours now," he replied, and from him I learned the whole story. My own leg was lost, and this was another, skilfully grafted on. A storehouse in Chicago, where limbs, bone, skin, muscles, and fasciae were carefully kept in culture media, was supplied by accidental deaths from violence from over the entire nation. A telephone call, a swift airplane, and the leg was here in two hours. Some unbelievably skilful manual surgery in suturing muscles, blood-vessels, and nerves; histoblastic and osteoblastic stimulants for hastening the union of tissues and bone; even a neuroblastic material that hastened nerve regeneration, made up the complex and difficult procedure.

"Nerve regeneration is the most uncertain and delicate thing about this business," Dr. Deland said, "considering that each nerve must grow a new set of fibers all the way down from their cell-bodies in the spinal cord. That is such a particular matter that we kept you unconscious for four weeks, fearing that worry and restlessness might interfere with the process."

He spoke very proudly of the achievement, and I gathered that it was not at all an everyday matter, as were some of the medical sights I had seen; this apparently was a rather recent development.

"So, I am not a cripple!" was all I could gasp.

I COULD do nothing except lie back on my pillow and wonder about it. I must have fainted or fallen asleep; for the next thing I knew the doctor was gone, and I was holding the hand of Elite Williams, who sat by the bed. I was very much bewildered by my recent and numerous shocks, and I stammered:

"Oh, I beg your pardon!"

"Don't be concerned!" she laughed. "You've been holding it for two hours."

I seized her hand, held it in both of mine, pressed it to me, and kissed it. Now, when she is only a memory, whose very reality I doubt, I still feel a lonesomeness steal over me when I think of her. She did not object in the least, and smiled down on me without the least confusion or embarrassment. Yet her smile seemed to be one of perplexity rather than of happiness.

"I'll tell you why," she said.

Again that astonishing reading of my thoughts, which the people of that age claimed was only guessing from acts and expressions.

"I'll tell you as soon as you are stronger."

"Make it right now," I insisted. "Nothing can shock me any more. I've been through too much."

She turned her big, brown eyes full upon me, till, under her gaze, my heart pounded and my breath came fast. My head swam from the pure joy of being so near her and looking into her lovely face.

"I'll tell it to you," she breathed softly. "You and I are beginning to love each other. You have not yet been rated, and I am so afraid that your badge will not be purple."

Those simple words must have held some tremendous significance, for she pronounced them so impressively, and in such a grave tone of voice, that though I didn't in the least understand them, I was very much worried.

"I haven't the slightest idea of what you mean," I said.

Eventually I got the story out of her, by means of a great deal of questioning on my part and of repetition on hers. She was not as thoroughly studied up on early twentieth-century history as was Dr. Deland, and was unable to get my point of view sufficiently to make clear explanations. But, after some effort, which was really delightful to me, I got the information straight.

Each person is "rated" with respect to hereditary characteristics and given a color badge. She showed me her purple cross, and I remembered that the doctor's daughter had a blue cherub. The form of the badge depended upon the occupation. For the purpose of eliminating undesirable characteristics from the race, and developing desirable ones, only persons with the same color badge could marry each other. The only exceptions were such persons as were willing to permit themselves to be sterilized by means of X-rays; and these were rare; they received a white badge. There were eleven other colors, so arranged that desirable dominants would overcome undesirable ones, and desirable recessives would reinforce each other.

By this method the human race had accomplished some remarkable things. Ninety-nine per cent of its insanity, crime, feeble-mindedness, tuberculosis, and congenital anatomical deformities had been eliminated. Humanity had purified itself of many physical and mental traits, which though not actual diseases, were a source of far more individual suffering and public harm than any possible personal inconvenience from the restrictions imposed by the marriage regulation. In recent generations, considerable positive progress had been made: the general health, stature, and physical beauty of the race had been noticeably improved. Before these considerations affecting humanity as a whole, matters of individual emotional indulgence had to stand aside.

"Until we know whether it is permissible for us to fall in love, it would be very foolish for us to commit all these little preliminary acts, which would lead us, each of them, further and more irresistibly into love, until we were no longer able to control it. It will be necessary to put off our demonstrations yet a while."

It did not seem to worry her very much. She explained it to me in a purely matter-of-fact manner, and seemed to be more surprised at my not having known such an obvious thing in the first place, than at the thing itself. For her, it was a most natural state of affairs, quite taken for granted.

"I have tried to read some of the books of your day," she went on, "when love was untrained and uncontrolled. It seemed that people were very foolish and most unwilling to handle themselves properly. As a result they got themselves into all sorts of troubles and inconveniences because of their emotions. The actions of the people in the books were so unreasonable and babyish that I could not keep on reading very long; I gave it up. Did children in your day receive no training at all?"

CHAPTER XII

Blue and Purple

"HEALING is complete," Dr. Deland said to me on his morning visit the next day. "Now you've got to learn how to use it. The new nerves have not yet learned to function."

There followed several days during which I had considerable leisure. Three times a day I was taken into a laboratory and put through a series of treatments: first electrical stimulation to all the nerves and muscles, and then voluntary movements; finally my entire body was exposed to some sort of rays under a globular glass generator filled with a greenish glow. There must have been some stimulant action in these rays to nerve-cell metabolism, for I never knew of a case of nerve injury to recover function in less than several months; but within five or six days I was able to walk, run, and jump quite as actively as ever. However, these five or six days seemed more like a year. Probably the great number of new impressions made on my consciousness and the vast amount of thinking that I did, make the time seem so long in the restrospect.

I had a great deal of conversation with Dr. Deland. I learned that he had never seen a case of smallpox or typhoid fever, and that he knew of them only as literary curiosities, though the organisms of both diseases were cultured in the laboratories. Cancer, he said, still worried them, though they succeeded in preventing or curing a fair percentage. They considered cancer an infection, not with an organism, but with a perverted form of the activity which is a specific property of the protein molecule; they called this perversion biodynosis, which sounds logical.

He described various "new" diseases, some of which had evidently existed during my day but had been unrecognized; some of the others had undoubtedly arisen recently. These were chiefly non-infectious inflammations of parenchymatous organs. One of them, distributed throughout the viscera, was ascribed to the nervous pressure of the complex life of that day; in its benign form it had dissociations and retrogressions of the personality; in its malignant form, a metabolic conflagration like an exaggerated hyperthyroidism, and was rapidly fatal. Medical men were thoroughly puzzled by it. There was a disease produced by the various forms of radiant energy so widely in use at the time, with tremors, a skin rash, and progressing to a catatonic condition. The new artificial foods were supposed to be responsible for an affection characterized by puffy joints and failing vision. There were new types of industrial intoxication due to new substances in use, and terrible new types of industrial accidents.

The Sigma Parabolic Ray was on my mind a good deal. It did not seem possible to my mind that such a simple rigging up of materials could have such an effect. I reasoned, however, that the detractive covering tapped the supplies of radiant energy constantly available in the atmosphere for public consumption; and that the metal and the solenoid somehow directed and focused the stream of energy. The common sense thing to do would have been to ask Dr. Deland to explain it to me. But, since my sojourn in the twenty-second century, I have begun to realize the strange fact that few of us do the common-sense thing. We seem endowed by nature to do the roundabout, illogical thing, that will get us into the most trouble. Only numerous generations of conscientious and intensive training had been able to develop in people the ability to do the reasonable and practical thing naturally and directly.

I felt a curious inhibition in speaking to him about the Ray, because I realized that it was a thing with which the people of my century could not be trusted. I felt rather ashamed of that; at the same time I felt so very grateful for their very kind and generous treatment of me, that I did not want to alarm them by letting them see that I was even thinking about it.

Nevertheless, I felt an irresistible desire to try out the Ray. A rabbit would do to try it on, or any laboratory animal. I thought and schemed. I was able to get about the hospital on a little automotive wheel-chair, and succeeded in finding the biological laboratory, and their experimental animals—funny little fuzzy creatures, the likes of which I had never seen before. They were about the size of a small rabbit, and evidently belonged to the rodent family. I also found the workshop where the numerous electrical apparatus of the hospital was repaired, and eventually got my hands on enough wire to wind me a little hollow coil around my middle finger. I had to do these things when no one was around, and to carry a casual air when people were around, for I did not want to be suspected of trying to kill someone. As it was, I felt like some guilty criminal. Therefore, these simple little things took a great deal of time. I finally succeeded in loosening the detractive cover of the flashlight and finding the openings for the two ends of my solenoid wire.

I SURMISED that Elite Williams, from the time that she had made the explanation about badges and marriage and the relations of young people, was carefully calibrating her conversation and the time she spent with me. I noticed that, and tried to play the game; and always made my conversation very much matter-of-fact. However, I was intensely curious about this amazing civilization, and had a million questions to ask. At first I felt a good deal of constraint about certain subjects, and hesitated about asking some of the things I had on my mind. But I found the girl absolutely frank, and willing to look every issue squarely in the face. Gradually I lost my hesitation, and asked every question that came into my mind. Probably I should eventually have even come around to the subject of the Sigma Parabolic Ray, had the opportunity continued. I doubt if it would have been possible for her to see a human situation in a false light, or to beat about the bush or in any way feel embarrassed in telling the plain truth squarely to anyone who asked for it. The whole world must have looked astonishingly clear and simple to her. I wondered if all the transfiguration of mankind that I saw in this age was not due largely to this ability to see things in their frank and honest relationships.

"Does anyone ever refuse to wear the color badge?" I asked, as an instance of the things I have just said.

"Color badges are symbols for sexual selection," she replied. "Anyone who does not have a badge on is either already married or does not want to be considered for marriage, and is treated accordingly. However, most people wear them anyway and all the time; for if you find your best friends among people with the same color badge, there is a strong probability that their tastes and dispositions will be most nearly like your own. Then, the color also determines how many children a family is permitted to have."

"How many children!" I exclaimed.

"Certain hereditary types are more desirable for propagation, and are permitted larger families."

My eyes jumped to the purple cross. She noticed it at once, and I could feel my face flame scarlet. With the perfect courtesy of that age, she took no apparent notice of that.

"Purple belongs to the service type," she said, "and is permitted four children per family, or just enough to keep its numbers stationary. Blue is the highest progress type, and is permitted seven children per family, to encourage the increase of that type. Dr. Deland's is blue."

I remembered having seen Dr. Deland wearing a blue caduceus.

"Suppose someone should marry out of color?" I asked.

"People don't," was her casual reply. "Such a thing would not occur to a normal citizen."

As I expected, as soon as I was able to walk well, I was summoned for my rating examination. This took me into a huge building with a golden dome, which was devoted chiefly to vital statistics. There I found that they had detailed records of my family both before and after my own generation. Part of the process was even more tedious than the tasks in the history department: answering long lists of questions, some of them informational, and some of them in the nature of mental tests; curious tasks that looked like solving puzzles; strange machines to operate; I had to take apart one machine and reassemble it; conversations with dozens of strange people, physical endurance tests, things injected into my arm, one of which made me miserably sick for a couple of hours. It took about five days before they were through with me. When I got through, I sat and waited for two hours in an office beside an empty desk, until the gray-headed director whom I had glimpsed several times, arrived.

"You are poor material for the practice of medicine," he began, holding a sheaf of papers in his hand. "That was what you had picked out for yourself as a career, was it not?"

I nodded assent.

"You are fortunate in having slept yourself out of it. We shall put you at pure scientific research after you have finished your preliminary requirements, and I am confident that we shall hear some fine things of you in time. Here is your badge."

He held a blue torch toward me!

What I stammered in reply, what he thought of me for wilting so suddenly, or how I ever got back to the hospital, I have no idea. But *she* knew at once what was wrong with me when I appeared, though the miserable piece of blue metal was deep in my pocket.

"Let me see it," she said firmly.

I held it up.

"A blue torch!" she exclaimed. "One of the highest ratings possible! Congratulations!"

She was taking it as a matter of course and seeing the bright side of it. For me, it meant the blasting of the only hope in my life. I was murderously resentful. I could have gone about smashing things and knocking in people's heads, just in order to get this girl away from them and keep her for myself. What kind of hearts and souls did these people have? I know that I had read awakening love in her eyes and words; and yet here she was, calmly willing to give it all up because of a few artificial tests and a difference in the color of two badges. Oh, what a world!

CHAPTER XIII

They Win

REALIZING that I now found myself in an age of self-control, and that it was the only course possible, I repressed my fury as best I could. I was powerless against an organized civilization.

"Is there any way to get around this?" I asked Elite Williams later in the day.

She shook her head.

"Our entire civilization is built on this conception." She was beginning to learn just what explanations my twentieth-century mentality required. "One exception would wreck it."

Unutterable depression followed. A world unspeakably dreary and gray; full of hurrying, tyrannical wretches with hearts as cold as all their machines; not a friend in it anywhere for me. Soon I must start again on the tedious historical job; half a day of that and a half day of research training in medical biology. And a life full of long years of this monotonous and uninteresting toil. Nothing to live for. No one to live for. Why was I here anyway? What was the use of staying any longer?

"Can we continue to be friends?" I asked her.

"Oh, yes. There is nothing against that, except possibly that it may be difficult for you. Dr. Deland came to me and warned me that in your day people had no training in handling their emotions. We are accustomed to this and know how to sublimate it."

For a couple of days I wandered moodily about the hospital and the streets. The one little light that I had had to guide my gropings in this terrible world had suddenly been snatched away from me. Elite tried to be kind to me but did not say much. I could see that she was intensely sorry for me, but knew that she could do nothing to help.

Then on the third day she burst into the room, a horrified expression on her face. Her hands were clenched on her chest, her breath came fast, and her whole attitude showed the deepest anguish.

"I overheard them in Dr. Deland's office!" She wrung her hands. "Perhaps I am doing wrong. What will become of you?"

"What has happened?" I was becoming dumbly accustomed to shocks and catastrophes.

"Dr. Deland has a visit from the Chief of Police. They say that you will have to go to a special school; that you cannot be trusted with your liberty in this community until you have had the proper education. They said that people in your time were barbarous, murderous, and ignorant, and that you are already planning murder! They seem to be very much afraid of you. Oh, what has made them think it? I do not understand psychology as they do, but I think you are good."

"No such idea ever entered my head!" I protested. "If they say that I am contemplating murder, they know more than I do about it."

It flashed across my mind that they must suspect that I am interested in the Ray. If so, with what uncanny cleverness had they ascertained it?

"But, what sort of terrible thing is to happen to me? I haven't *done* anything. A school? I won't particularly mind going to school."

"But—they will shut you up and keep you there—like they do the retroverts. Adults do not train like children——"

That suddenly dawned on me too! It was a sort of prison. They put people in prison *before* the crime was committed, to prevent its being committed. That sounded logical. Even in my time prevention was recognized (if not practiced) as the watchword of medical work, and crime was being recognized as pathology.

But for *me*? What crime was I going to commit? I certainly did not seriously contemplate any crime. What were they going to try to accuse me of? The heartless inexorability of that scientific world suddenly burst over my consciousness again.

Her fear began to infect me. Just from her attitude I gathered that I was in some real danger. I paced around the room. I didn't feel that I belonged in this world. I grew panicky and lost my head.

"They are coming!" she panted, looking down the corridor.

I dashed out. She tried to prevent me, saying sadly:

"No! That won't help."

Without another look at her, I started down the corridor. Had I but known, I would at least have bade her good-bye in some way. I ran at top speed away from the approaching group. In a moment I found myself in front of the automatic elevator. I leaped in, slammed shut the door, and rode to the top, leaving the door open as I went out, so that the elevator could not descend and they could not follow me up.

TRAVERSING another corridor in a few jumps, and tearing open a door, I found myself in the same tower from which I had for the first time viewed the city; and I fled out on the roof of the hospital. There I cowered in a corner, as far away as I could get from the door by which I had emerged. I realized that it would not be long before they were out after me. I had no idea of what means the police of that day had for catching recalcitrant arrests; but I hadn't the least doubt that they would be effective. I felt puny and helpless with the organized world against me.

Feeling myself rapidly growing desperate, I reached into my pocket for my solenoid and detractive cover. All I needed was the elongated piece of iron. My pocket knife! I still had my own old one, which had been preserved to me along with my watch and fountain-pen. I slipped the knife into the solenoid, rolled it up in the detractive, and left the button for making the contact on the outside on one end. A couple of men appeared at the door of the little balcony from which I had come.

Seeing what I was doing, they turned and fled. One of them was too late. I had pointed my coil and pressed the button. He dropped instantly, sprawled over the roof, and lay still.

In another second a man appeared, climbing out of a window ten feet to the left of me. Just as he was about to drop a short distance to the roof, I whirled around on him with my weapon and pressed the button till my muscles cramped. I held it savagely and pointed it steadily at him, for I was alarmed out of my wits by his nearness. He slumped suddenly and fell backwards out of the window. But he never reached the roof. He just melted and was gone; a few rags of his clothes and some pieces of metal dropped to the slates. This left me trembling, but fanned my bravado.

"Come on, all of you!" I shouted. "I'll show you!"

An airplane sped toward me from the swarm in the distance. The police were working fast. The aeronaut shouted at me:

"Throw it down or I'll spink your spool!"

The expression was new to me, but I knew what he meant. He must have spoken through some sort of an instrument, for his voice sounded very near to me. By way of reply, I pointed the thing at the arplane, pressed the button, and swept it around in an arc. I couldn't see the man, but the machine suddenly turned on its side and plunged downward like a knife, grazing the corner of the building with a sickening crunch, and disappearing from my view in the street below. Two other approaching airplanes immediately whirled and fled.

"They can't get me," I thought; "but what shall I do here? I've fixed myself with them for good; and they

can probably see every move I make. I wonder if they can shut off this broadcasted power?"

In a moment another airplane came toward me. I turned my ray toward it and swept it around and back, but it had no effect. The machine approached rapidly, making directly for me. I noted that it was only a small affair, about three feet long, too small to hold a man. Nearer it plunged, till it was almost upon me. As I dodged, it continued for a moment and then swerved toward me. Then there was a flash of purple, a loud report, and a stabbing pain through my head.

EPILOGUE

I HAD fainted and been knocked unconscious so many times that it had become a common occurrence. The strange thing about it was the ease with which I passed from one existence to another. While I was unconscious it seemed a thousand years. When I opened my eyes, it seemed that but a few seconds had elapsed.

But here I was on a white bed in a white room. It was a familiar room. There hung my maroon-and-white "Chicago" pennant; yonder was Rose & Carless' *Principles of Surgery* and Jordan's *Bacteriology*. Dr. Mendenhoff stood in the door watching me. Outside I heard the clang and rumble of a street car and the buzz of a Ford horn.

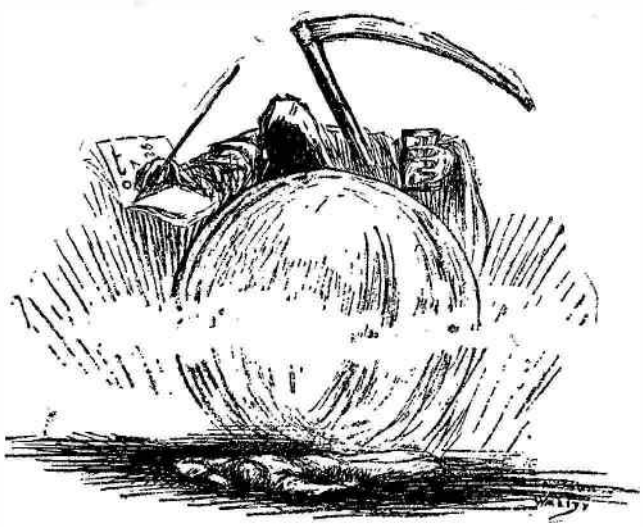
A newsboy shouted shrilly:

"*Star* or *Journal*, Mister? Read about the turrible Omaha murder!"

"How long have I slept this time?" I asked in an irritated tone of voice. "And how did I get this nasty bump on my head?"

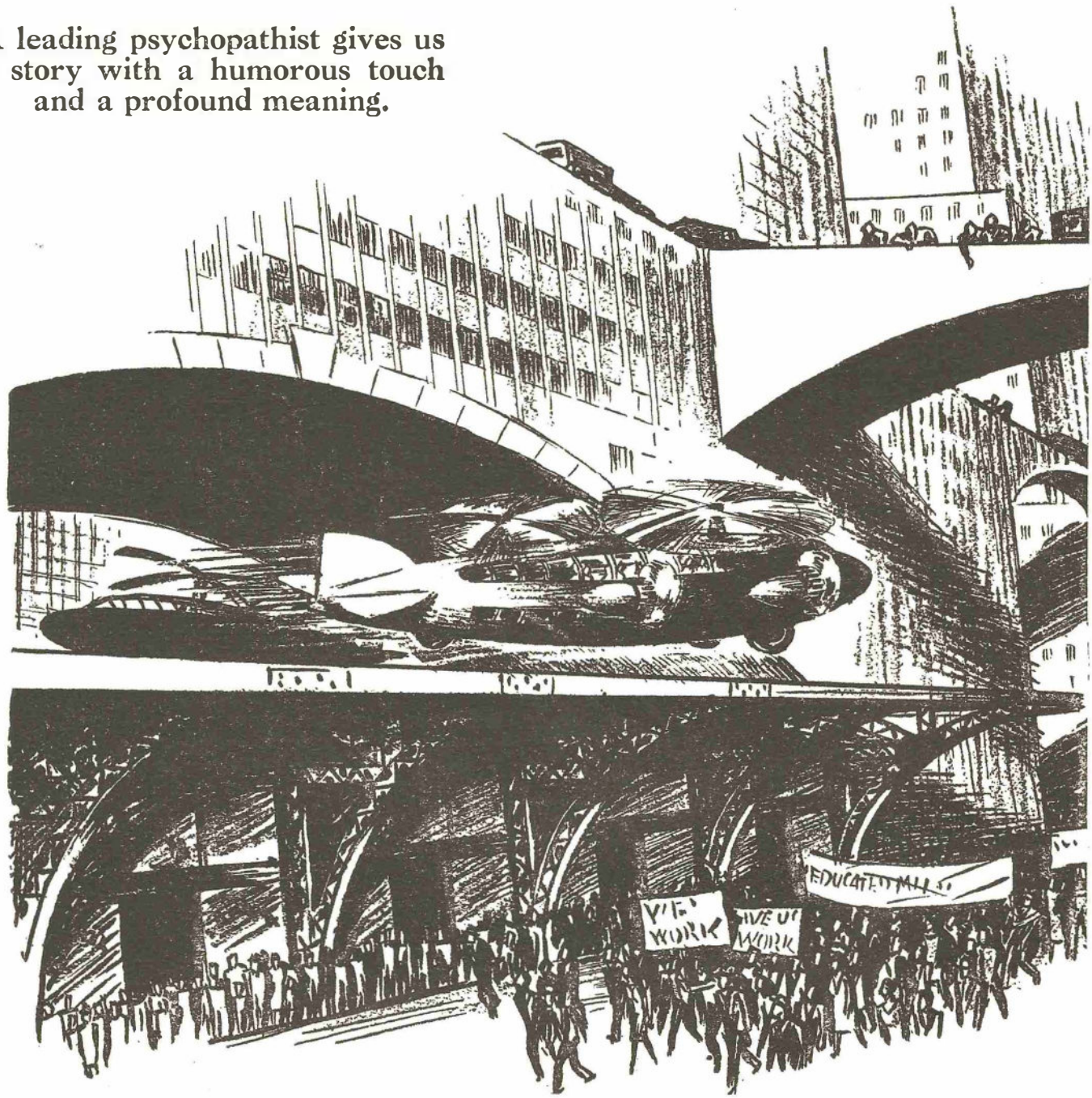
"That bump is a puzzler," the doctor replied. "You must have done it when no one was watching you. That anesthetic of Bauer's is a remarkable thing. You got three drams of it, and you've lain perfectly motionless for thirty-six hours. A moment ago the night nurse reported, insisting that you were gone, that you had disappeared, and were nowhere to be found. I was called to the hospital, and have just come in the door, just in time to see you waking up."

THE END



White Collars

A leading psychopathist gives us a story with a humorous touch and a profound meaning.



"THE White Collars are on parade again!"

The words were spoken with a mild contempt.

Far below, in the canyon of Fifth Avenue, a thin line of men and women were struggling against the traffic. They carried banners, painted signs, and at the head of the column an American flag. It was a disorderly march, though they were all moving in one direction. That, and the fact that they were all united in purpose, were the only evidences of harmony. Their painted signs expressed their desires; their anxious faces told of the utter hopelessness of their ambitions.

What they wanted was work and food.

In order to gain the food they had to work.

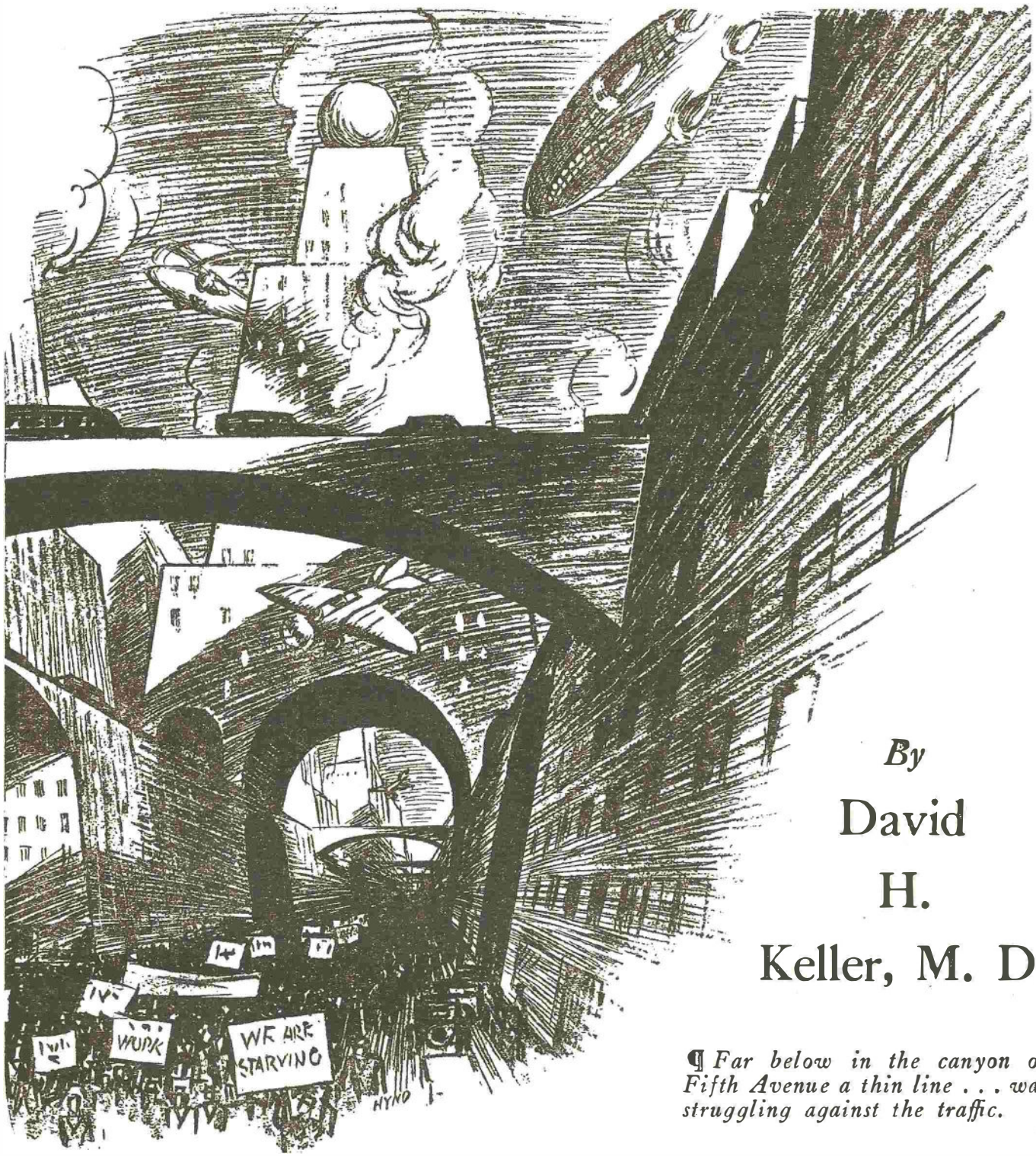
And there was no work for them!

The two well-dressed men, who watched the struggling mass from the vantage point of an eleventh story office window, gazed on the marchers with mingled pity and contempt. One of them repeated:

"The White Collars are on parade again!"

"At least it is an interesting sight," answered his companion, in a slightly disinterested manner.

"No doubt interesting to you, Senator, but, as a demonstration, it is useless and hopeless. The poor devils!



By

David H. Keller, M. D.

¶ Far below in the canyon of Fifth Avenue a thin line . . . was struggling against the traffic.

They cannot help themselves and they will allow no one to help them. Let's go down on the curb and watch them. Have you ever seen the group close at hand?"

"Not as a group. Of course, I have employed individual members of the class when necessary, but they are so conscious of their superiority that they are unpleasant employees. Taking them as a group, I fancy that I am not at all interested in them. What is their complaint?"

"They claim that they want a chance to earn an honest living. Of course, that is all bluff. There is a lot of work for everyone, provided he really wants to work. It would pay you to look into the matter. Let us go down to the street and watch them. As a Senator, you may have to deal with the question soon in Congress. It really is becoming a national question—perhaps, a national menace."

The two men took the elevator and were soon on the street. Only a few feet away, amid the traffic, they saw the disintegrated column of marchers, tired, worried, soiled with dust and the sweat of fatigue. Their banners and signs told the story of their despair.

"GIVE US WORK!"

"HELP US MAKE AN HONEST LIVING!"

"EDUCATED MEN DEMAND ADEQUATE INCOMES!"

"WHITE COLLARS, AS WELL AS COLORED ONES, NEED FOOD!"

The two business men looked at the army of unemployed and then at each other.

"What do you think of it, Hubler?" finally inquired Senator Whitesell. "I have been so busy with my con-

struction work on the Colorado River that I have paid but little attention to conditions in the larger cities. I have not even been attending to my senatorial duties as I should."

"Suppose you come over to the Club and let me tell you about it," suggested Jacob Hubler.

THE traffic was so thick and noisy that for a few minutes it was only possible to exchange monosyllables, but once inside the quiet of the Engineers' Club, in the luxurious arm chairs provided for the relaxation of the tired business men, Hubler lit his cigar, passed one to his friend, made himself comfortable and started in with the explanation of the strange parade of the White Collar men.

"There have been a number of curious parades in history, but this one is probably unique for any age or country. There have been demonstrations of slaves, political groups, and muscle workers. Victorious armies have passed down the Appian Way in Rome and up Fifth Avenue. Hundreds of thousands have showered Caesar with roses and Lindbergh with confetti. But a parade of White Collars is absolutely new.

"Of course, you are acquainted with the educational programme that has always been considered so important to the life of our nation. Early in our history the average man could only read and write, while the unusual man, on account of his financial and social position, was capable of receiving a collegiate education. Later on, small colleges multiplied, till every city boasted of one or more, and every town had its academy. No community was satisfied till it possessed a center of higher learning. These schools had to have pupils to justify their existence. There were useless classrooms and wasted professors without a constant supply of pupils. Consequently, the young people were urged to acquire an education, and if they could not finance it, they were aided in every way.

"Gradually, many of the smaller colleges were merged into larger ones. The remaining universities became gigantic in the scope of their effort to uplift the individual. At first, a college of five thousand pupils was exceptional, but later on some universities had fifty and even sixty thousand pupils. Education became synonymous with culture; a college degree was supposed to be the necessary pass into the higher levels of society. Instead of asking a man what he could do or what he was worth, the questions of choice were: 'What is your Alma Mater?' or 'What Fraternity did you make?'

"Gradually, the rich men of the country became interested. The original endowments were thousands and hundreds of thousands. Later on, millions of dollars were given. Men like Hiram Smith of Universal Utilities thought nothing of giving a quarter billion dollars at one time to one university. We have several such endowments right here in this city.

"What was the result? Naturally, everybody who wanted a higher education got it; at least, everybody received all that he was able to absorb. Goodness knows it was little enough in many cases, because there seems to be no real relation between education and intelligence, and a real clever man once told me that nineteen-twentieths of what we know is gained outside of the class room. The colleges and universities of our country turned out, with almost machine-like regularity and precision, lawyers, dentists, journalists, surgeons, architects, engineers of every type, and any number of professors. Tens of thousands were added each year to all the so-called learned professions.

"These men and women were trained to plead legal cases, fill teeth, write editorials, cut out tumors and plan buildings. All this, and many other forms of highly technical work, they became proficient in, but none of them was taught to make an adequate living.

"Meantime, while the opportunity for employment of those skilled in such mental labor increased, it did not increase in proportion to the number trained in these various fields. Scientific management made it possible for one doctor, or one lawyer, to serve a far larger clientéle than he was formerly able to do. Ford showed the world how to speed up mass production in machinery, and the same principle was used in every line of the higher specialties. A man used to have a private lawyer or a family doctor. Now, he employs a corporation for legal matters and a clinic for his physical ills. I went to one of those clinics last year. They see over twelve hundred new patients a day. In two days, exactly eleven hours of actual time, I was examined by twenty-seven doctors, each a specialist in his line. I had everything examined except my soul, was told that there was nothing wrong with me, and was charged ten thousand dollars. They knew my Dun and Bradstreet rating before they started with the examination. Just think of twelve hundred a day going through a medical mill like that! And think of the number of old-fashioned doctors who could be supported by that many patients! It is the same way with all the learned professions. Standardization, specialization and efficiency make it possible for every educated man to serve ten-fold as many as he used to—and yet, there are ten times as many highly educated persons to do the work as there were twenty-five years ago. Ten years ago there was a suspicion that the importance of higher education had been overstressed. Five years ago the economists were frankly worried. We have had these parades in New York and in all of our large cities for the last two years.

"Those are the White Collar men and women on parade. They are the great mass of the population who are highly and intensely educated; they are all dressed up intellectually, and there is no place for them to work; consequently, they are starving to death.

"They are learned and aristocratic and proud. Possessed of a strong class consciousness, they refuse to do anything that they have not been educated to do. Can you imagine a trained physician working as a hired chauffeur? A graduate of a law school working as a ticket seller in the subway? They say that they are starving; they demand work; they cry for food; but what are we going to do with them? Civilization cannot go back. Modern methods of labor in every department are here to stay. The supply far exceeds the demand.

"THERE always has been and always will be work for the manual laborer. Even in the age of the greatest mechanical advancement, the era of electricity, there is always work for the artisan—the plumber, carpenter, plasterer, structural steel worker and paper hanger. We cannot, in my business, get enough plumbers to do the work, and twenty dollars is their standard pay for a seven-hour day."

The Western Senator laughed as he interrupted.

"You talk mighty well for an uneducated man, Hubler. Where did you get all this line of talk and the big words?"

Hubler, chuckling, replied:

"Naturally, it is not original. I am a plumber, not a sociologist, but I was interested in this White Collar question, so I hired a man by the name of Pitkin to make a survey of the problem for me, and most of the ideas he gave me I have been rehashing to you. In fact, I read a paper on the subject before the International Association of Plumbers. After Pitkin studied the matter, he became rather interested in it. He feels that we are facing a crisis by reason of the great increase of high grade intelligence, for which the nation can find no fitting employment. He said that a few years ago there were five times as many highly educated men and women as there were positions for them, and that matters are

much worse now. He told me that he was frankly worried about it, because when these highly educated people failed to find satisfactory and remunerative work, they became maladjusted, developed mental disturbances, complexes, blocked activities, and finally brooded into an unhappy anxiety state and then even became insane. Those are almost his exact words. I learned part of his report verbatim. Even now I am not sure what some of the words mean, but I do know that these people make poor citizens—they are really super-mendicants and refuse to do the kind of work that needs to be done.

"You know how I was raised, Whitesell. We were boys together. You worked and so did I. We had to work to keep from starving and freezing to death. I went a little to night school and always I have been a great reader. You went to night school at Cooper Institute. We learned a little, but always we worked with our hands; we knew what it was to be muscle tired; we were familiar with sweat.

"I have a boy. A mighty fine fellow! I want you to meet him on this trip if you can manage to come up to the house. You ought to have a meal with the wife, anyway. I could have sent that boy to college, but I saw this White Collar trouble ahead; I saw what it was going to be earlier than most people saw it. I told Larry that his future lay in the plumbing business. Society has used plumbing since the days of Rome and it is going to keep on needing it. There will always be plumbing and more plumbing and better plumbing. So I taught him my trade. And by the Seven Sacred Caterpillars he is a fine plumber.

"It has worked out fine for him. He is a Master Plumber. I give him fifty plunks a day for his time, and he is worth every cent of it. He works in overalls and gets his hands dirty. He has a fair income, and when he inherits my millions he will know what to do with them. He has learned the value of a dollar. He drives a Ford car, though he could get a Rolls Royce merely by asking for one. He knows that he is a plumber, and he is rather proud of being a good one. He is satisfied with his work and his chance for advancement in life. He is not nervous —but he is in love.

"Of course, he should have fallen in love with a plumber's daughter, but he met a young lawyer, the daughter of a doctor. He met her at some kind of a party, and fell in love with her at first sight, and after that she gave him one date. When she found out that he was nothing but a plumber, she cut him cold, just wouldn't have anything more to do with him. The boy was so unhappy that I investigated the family. They are regular White Collar people. The father is a physician, some kind of a specialist, the mother is a college graduate and teaches Greek when she can find anyone who wants to take lessons; and the daughter, as I told you, is a lawyer. They are starving to death—simply because they are too highly educated. They do not know how to work. In spite of all their education, there is not enough income between the three to pay even the barest necessary expenses. They are dependent on charity this very minute, and yet the proud young lady refused to consider the love of my son, because she is a college graduate and he is a plumber.

"They were in the parade today. Last year only ten thousand had the desperate courage to march and carry unemployment signs. The morning paper estimated that there would be seventy-five thousand White Collars in line today. Every one of those marchers was a college graduate; and all of them are out of work.

"That, Whitesell, is the explanation of what you have just seen on Fifth Avenue in the proudest city of the world. You are a United States Senator. Have you any solution?"

The Western Senator frowned as he replied:

"YOU know how I became a Senator. I made my money building dams. My wife and daughter became restless and wanted social recognition; so, I bought a seat in the Senate. In fact, my business associates wanted me to go there, because they felt that our group was not being properly cared for. But first, last and all the time, I am a Western man and I still love to mix concrete. Out where I live there is a lot of work, and we never have enough men and women to do it. We could use all of those seventy-five thousand men and women. I do not see why being a college graduate should keep a man from earning a living mixing concrete or making forms or herding cattle, and a woman would make a better housewife and cook if she did have a university education. I am sure that I could find work for all these White Collar people if they would come West."

Hubler laughed.

"That is the very point of the whole matter. They could support themselves here in New York if they were willing to work; but they want to do only the specialized work that they were prepared for. Do you know anything about the Simon-Binet test? It is a kind of yardstick with which to measure the intellect of a person. The superior adult, according to this test, has an intellectual quota of 130, or over. It used to be considered that one per cent of the population possessed this grade of intellect. This made a superior population of 1,200,000. But these superior adults were apt to breed their kind, the universities made more, and now it is believed that there are nearly 5 per cent of these extraordinary individuals, all capable of doing very fine work, and unwilling to do anything of a manual nature—and there is not enough high grade work to go around. A sociologist told me that there were three highly trained minds for every special place in our modern society. Consequently, two-thirds of our White Collars are out of employment—and are starving —not for luxuries, but for the actual necessities of life.

"And the world does not want them at any price. The economics of labor, the standards of mass production dictate the formula, 'NEVER GIVE TO ANY MAN WORK, WHICH A MAN OF LESS ABILITY CAN DO EQUALLY WELL, AS FAR AS THE FINISHED PRODUCT IS CONCERNED.' Why then should they give work to a 130 per cent mind at a high salary when the same work can be done by a 100 per cent mind at a smaller wage? And they believe that men, who are barely able to do certain work, do it better than superior minds, because they are content and are never ambitious to improve their condition. They realize that they are at the top of the ladder, as far as their minds are concerned. It is far different with the White Collars. Unless the Government does something, the States will have to do something in order to protect their own economic safety. Private capital is uninterested and unsympathetic. Universal Utilities are working now on the stenographic problem. Of course, they are trying to keep it quiet, but facts leak out. Unless something is done, we will find that instead of developing a race of supermen, we have formed a breed of super-paupers, highly educated mendicants. We have physicians, journalists, dentists, architects, lawyers with ragged clothes, empty stomachs, and cold and unfurnished apartments, but possessed of unlimited pride and an unwillingness to improve their own condition or to help themselves in any way. Naturally, they are poor citizens, and unpatriotic. They blame the Government for all their troubles, and do not realize that they alone are to blame. They will do all that they can to promote political unrest and even revolution."

"They cannot hurt the Government," declared Senator Whitesell, in a most decided manner.

"That may be true. You may be right, but they may become a real menace. They have the brains of the nation at their command; you have to realize that fact. Do

you think that I am exaggerating facts and making conditions seem worse than they really are?"

"I certainly do, Hubler."

"Then come with me on a tour of their district. They all live together, almost in a Ghetto. They have been driven to that part of the city by the low rents that prevail there. Laborers are making such high wages that they refuse to live in such tumbledown rookeries. I tell you what we can do. Let us go and visit this family that has so persistently told my son that he is not their social equal. Let's visit the girl and see how my son's love affair is progressing. She will probably be at home to-night with her parents, tired from the long march and exhausted with hunger. Fortunately, they do not know me personally, though I know a great deal about them from the report of the Detective Agency. Suppose we offer the entire family positions out West and see what their reaction is?"

AFTER a hearty supper at the Club, the two men drove in Hubler's car to one of the oldest sections of the Bowery. The streets, houses, and stores all spoke of decay and poverty. Finally, they came to a stop before a four-story house. After climbing long flights of rickety stairs, almost equal in danger to an Alpine mountain, the two men came to the Reiswick apartment. Their reception there was dignified but extremely cool. Evidently, the White Collars had learned to look with suspicion on all visitors showing signs of wealth. However, Dr. Reiswick asked them to be seated on the only two visible chairs, while he and his wife and daughter sat on the narrow daybed.

The situation seemed to be an awkward one, until Senator Whitesell showed the reason for the visit.

"I am a large employer of labor, Dr. Reiswick, and I understand that you and your family might be induced to accept positions that would pay a satisfactory salary. The proposition is this: I am from the West. I want to employ an educated man who will serve as timekeeper and paymaster for a force of about two hundred day laborers. I also need a woman to look after the washing and ironing and mending of the camp. She will be in charge of about twenty Mexican women who will do the actual work. She can have an assistant, and when I talked to my friend about these three positions, he thought you might be induced to accept them. The combined salaries would be about three hundred a month, with all expenses paid."

He had hardly finished when Dr. Reiswick stood up. He was trembling with rage and could hardly speak.

"Do you realize," he demanded, "that I am a physician? A graduate of Yale? Do you understand that my wife is a graduate of Vassar and can teach Greek? And do you further know that my daughter is a graduate of Columbia? She had a scholarship granted her, and we sacrificed everything to help her gain her degree in International Law. Do you not see how insulting you are to ask us to keep time and mend and wash for Mexicans in a desert?"

"No insult intended," said Whitesell, soothingly. "We simply thought that you wanted to work. We had a right to think so after you appeared in the parade today."

"We do want to work," answered Mrs. Reiswick, proudly. "My husband is an expert in removing tonsils. In fact, that is his specialty. No one in New York can remove tonsils better than he. I teach Greek. My daughter headed her class in International Law. We should be glad if you would give us work, but it must be the kind of work that we are trained to do, the kind that we have devoted our lives to. We should even be willing to go to a Western town, if my husband could take out tonsils and I could teach the rural people the Greek language."

Suddenly, impulsively, Jacob Hubler arose and walked over to the young lady:

"Miss Reiswick," he said quietly, "my son is very much interested in you. If you will permit him to see you socially, to become better acquainted with you, I will give you and your parents a chance to really work at your professions in New York, right here in the city."

Miss Reiswick looked puzzled.

"Who is your son?" she asked.

"Larry Hubler. You spent an evening with him a few months ago, but after that you refused to see him."

"I remember now," she replied. "He was that interesting plumber. O, Mother dear, you remember him, do you not? You talked a little in Greek to him, and he thought it was Yiddish. Father, you will recall that you tried to explain to him your particular technique of tonsillotomy, and he was so uninterested in your lecture. Naturally, nothing could be expected of a man who had never gone to college. I am afraid," and here she walked over to Hubler and looked him full in the face. "I am afraid that my social standing forbids any intimacy with a plumber. Undoubtedly, his parents are very ordinary people, without ambition. No doubt, you are some kind of an artisan, of some nondescript variety. The door is open, and the interview is over. Walk quietly as you go down stairs, because there are families of culture living in this house who do not like to be disturbed by day laborers."

There being nothing else for them to do, Senator Whitesell and Jacob Hubler walked down the steps and out to their car, swearing none too gently.

Jacob Hubler was inclined to disregard the entire incident. He wanted to forget it and he tried his best to help his son to do the same. He was confident that Larry would soon overcome his infatuation for the beautiful young lawyer.

WHEN Senator Whitesell left New York for Washington, Hubler lost sight of the White Collar parade, and it was not until a few weeks later, when the newspapers were filled with the details of a proposed investigation into the question of unemployment of the educated masses, that he recalled his part in the movement that was to end in such a striking and dramatic manner.

For he had started Senator Whitesell thinking, and to think, with that gentleman, was to act, and to act was to do so in a decisive manner. He was a power in the Senate. In fact, the financial group that he represented dominated and overshadowed the great business interests of the country. They told Whitesell what to demand, and he told the nation. This time he did his own dictating.

His remedy was very simple.

There was to be no unemployment in the entire nation. All over the country public works of a vital and necessary nature were to be started. A Federal Reserve Fund of three billion was to be set aside to pay for these works, and they were to be started and carried to completion, just as fast as was necessary to furnish employment to every adult male. His wage was to be sufficient to support his wife and little children. All males over eighteen were required to work, and all females over that age were either to marry or to work as domestics and housekeepers in the labor camps. Thus, all in the nation would be enabled to support themselves and provide their families with the necessaries of life.

The Employment Bill was accompanied by an educational section, providing for the closing of many of the colleges and for the turning of others into trade schools. A careful survey was made of all of the professions, and each year only a very few of the brightest applicants were allowed to begin the study of each profession. Thus, it was definitely provided that yearly only the absolutely necessary number of doctors, dentists, journalists, architects, and teachers would be graduated, and each of them

would have a definite position and that position would be his for the rest of his life. Thus, he would be assured of receiving an adequate income, equal at least to the income of the bricklayers, steel men, and plasterers, and plumbers in the nation.

As soon as the details of this proposed act were published in the daily press, rioting started in all the large cities. The White Collars lost no time in making known their opinion of such legislation. With concerted action, they raided the sections of the city where the artisans lived in luxury, and many windows were broken and heads cracked before the educated masses were driven back to their dingy quarters. In some cities, the police force was inadequate, and the fire department was called upon to turn high pressure streams of water on the rioting collegians.

Opposition made Senator Whitesell more determined than ever. He forced his bills through Congress and personally made the President see that his political future depended on his signing them. Before Congress adjourned, one of the most remarkable pieces of constructive legislation ever known became a law. Its legality was at once confirmed by a test case before the Supreme Court, and theoretically, the White Collar problem was no longer an unsolved question.

But there was resistance!

IT was not to be supposed that the White Collars immediately submitted. This opposition was anticipated and provided for by an Enforcement Act. Every adult of both sexes had to register and show satisfactory and permanent employment, or accept the work assigned to him or her by the Government Bureau of Work. All refusing to accept the assigned positions were forced to leave the country. They were given a thousand dollars in gold and were permitted to go anywhere they pleased. But they lost their citizenship. At once, there was a rush of highly educated people to foreign shores; but it was not to be supposed that the other nations, who were having troubles of their own with their surplus of intelligence, would calmly permit an invasion of their lands by hordes of White Collars. Stringent immigrant laws were passed, and finally only a few of the Central and South American Republics welcomed the emigrants from the United States. This welcome was accorded more for the gold that they carried with them than for their massive intelligence.

The law was enforced. At first, it was pathetic to see professors, dentists, physicians, journalists, architects actually working, mixing concrete, building roads, and working on the government farms. Books were written, showing the horror of it all, but these were confiscated by the Secret Service Department as dangerous propaganda. Finally, the long hours of actual muscle work, the three hearty and regular meals each day, and the long sleep each night, made possible by tired bodies and satisfied stomachs, so cleared the intellectuals of the toxins that had formerly flooded their systems, that life looked entirely different to them. They became different men and women, they sang at their work, and the number of babies born in the Labor Hospitals to happy mothers and proud fathers steadily increased.

In the meantime, Larry Hubler had never ceased to continue his suit to win the beautiful young lawyer, Angelica Reiswick. She tried every known method of snubbing him and discouraging him, though she did occasionally accompany him to a hotel or restaurant for an evening meal, which her empty interior (one part of her body was not highly educated) thoroughly enjoyed. She felt that even a hungry International Lawyer could accept an occasional meal now and then from an opulent plumber, but not a thing else. Consequently, she refused his plea for a relationship more intimate than a gastronomical one. She laughed at love and refused his offer of marriage.

The National Labor Law was strictly enforced, in spite of the determined and strenuous resistance. Pale undernourished men and women were given their choice between the labor camps and emigration. Thousands voluntarily left the country without waiting to be shipped out like so many cattle, but each one was careful to claim the thousand dollars in gold.

The Reiswicks led the resistance in New York City. Finally, they alone of the White Collars were left idle in that metropolis. The morning papers featured the fact that there were only three White Collars left among eight million workers. Dr. Reiswick wrote long articles to the medical magazines, claiming that there must be at least a few tonsils left for him to operate on, and that his days of usefulness as a specialist were certainly not numbered. His wife delivered impassioned Philippics in the foreign sections of the city in the forlorn hope that some among her audience would understand her Greek and support her, while Angelica argued the matter from soap-boxes, even in Wall Street, with the faithful Larry ever in attendance to chase away the newsboys who were enthusiastic over her beauty. Larry did not work very much as a master plumber for several months. He was too much in love.

He argued with the family.

He and his father argued with the family.

ALL of the arguments failed, and finally, in spite of everything, the last White Collar family left in America prepared to take their three thousand dollars in gold and go to Honduras. They selected this country after a great deal of deliberation. The Doctor had found that practically every citizen of that country still had his tonsils, and he was confident that when they found out how clever he was in removing them, they would not delay in having the operation performed; his wife learned that no one in that country spoke Greek, so she was sure that they all would want to learn it, while Angelica, when she found how many small republics were neighbors to Honduras, was confident that she would have every opportunity of practicing International Law.

The day finally came for their sailing. The papers featured it.

Sob-sisters on several newspapers wrote tearful articles about the fair Angelica, who might have married the son of a millionaire plumber, had she deserted her family and her principles.

Escorted by members of the Secret Service, who were instructed not to give them a single opportunity to escape, the Reiswick family embarked for Honduras. As a family and as individuals, they did not regret their decision. Life in New York had been one of hardship and hunger, and they were satisfied that things could not be worse in Honduras, especially, if the bananas were cheap, and tonsils plenty.

The boat steamed slowly down the harbor, passed the Statue of Liberty and sailed out through the misty narrows and Ambrose Channel, and then——

The Doctor and his wife discovered that their daughter was missing.

Search as they would, not a trace of her could be found.

To put the matter plainly, she had been kidnaped.

Larry Hubler, by the use of bribery, had been able to spirit her off the vessel. In spite of her cries and struggles, he had carried her back to the city, and while her parents were hopelessly bound for Honduras, she was traveling in a taxi to an apartment on Riverside Drive.

A preacher awaited them there; also Jacob Hubler and his wife. In the little parlor her wraps were removed,

(*Continued on page* 428)

Paradox

By

Charles Cloukey

Author of:
"Sub-Satellite," "Super-Radio," Etc.

IT is in the light of later knowledge that apparent inconsistencies often disappear, or are explained. Who has not experienced an occurrence that seemed absolutely inexplicable, perhaps for years, when another event fully explained the old experience? Life is full of paradoxes, and science has its share of them. Perhaps the inconsistencies of the fourth dimension and the puzzles of the Einstein Theory will become simple matters to some future generation. Perhaps it is because Mr. Cloukey does not take the world so seriously that he can poke a little fun at us, and that some things about time-traveling become so simple when we read his story.

A Prediction

"IT is impossible," stated Preston.

"Two hundred years ago any ordinary man would have said that television was impossible, and could have given several excellent arguments to prove it," returned Sherman easily. "Just because we can't do it now is no reason to say that men will never learn to travel in time as freely as in space. H. G. Wells, in his 'Time Machine' . . ."

Preston interrupted impatiently. "I've read the book. It should be obvious that Wells used the idea of traveling into the future merely as a background upon which to superimpose his ideas of the ultimate destiny of civilization. Since Wells there have been dozens of time stories, wherein the hero invents a machine, or discovers a ray, or something, which takes him immediately to the year 4443, or the day after to-morrow, or prehistoric times, or some other time, wherein he meets the beauteous heroine, et cetera. The writers of such stories follow a definite formula, gentlemen. They're a bunch of imaginations. The idea of time-traveling is a scientific absurdity, for dozens of reasons.

"Did you ever consider the fact, Sherman, that if you were to travel to the year 2000, for instance, through time or the fourth dimension, you would have to travel quite a few million miles through space also? For by the year 2000 this earth, and the solar system, and probably our whole universe as well, will have moved a long way through space from the place they occupy at this second. And that's only one of the many objections."

"I don't consider even that beyond the realm of possibility," replied Sherman. "When you consider the accomplishments of science in the past, it is rash to say that anything is imposs . . ."

Preston interrupted again. "You will find inconsistencies and paradoxes in any time-traveling or four-dimensional story if you look for them. And . . ."

"Undoubtedly. But suppose you told a man in 1700 that a device would be invented whereby a man three thousand miles away from a speaker could hear his words sooner than a man sitting three hundred feet away in the auditorium. The man, even though he were an enlightened and intelligent individual, would declare that the thing was a scientific absurdity, a paradox. 'Sound,' he would say, 'travels a mile in five seconds; therefore the nearer person would hear the voice first, even though a marvelous device did make the sounds audible to a man three thousand miles away.' A story involving such a device would be inconsistent to his point of view. And yet we know that radio waves travel so quickly that a man listening in with his heterodyne, actually does hear the speaker's words a minute fraction of a second before the person in the rear of the auditorium. What is 'scientifically inconsistent' in one generation can often be fully and logically explained by the science of the next. Therefore I believe that a time-machine may, and probably will, be invented at some future time. When science knows more, perhaps many of our inconsistencies can be explained away."

There was silence for a minute after Sherman had finished this exposition of his ideas. Then Raymond Cannes, who had not spoken previously, said slowly, addressing us all, "You are right, Mr. Sherman. The time-wave, that mysterious force which travels through time, the fourth dimension, will be discovered in the year 2806, just after the second terrible Martio-Tellurian War. It will be discovered by a great scientist who will be called Dwar Smit, the twenty-ninth century equivalent of Edward Smith, and it will be called the NN-4 wave, for a reason which I do not understand."

Cannes Begins His Story

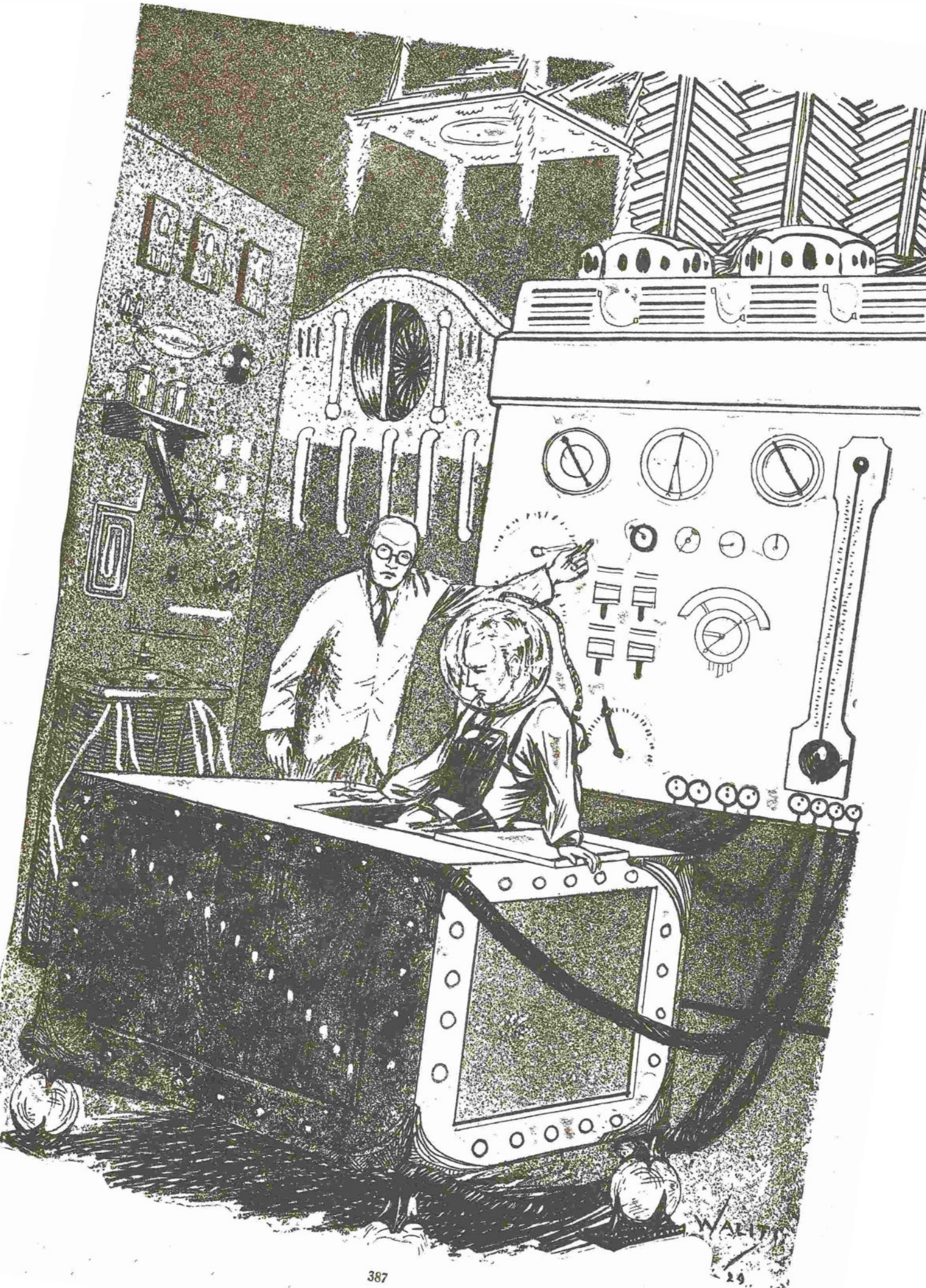
A FEW words of explanation are necessary before I transcribe the story told by Raymond Cannes.

A certain exclusive Philadelphia club, which shall here be quite nameless, is the regular Sunday night rendezvous of a small group of the more serious-minded social aristocrats of the city. They meet in a corner of the lounge-room and discuss, often with some heat, any political, economic, social, literary, or scientific question that happens to come up. Their informal meetings are usually quite interesting, if you happen to be the sort of person who could enjoy an impromptu debate.

There were eight present that evening, but Preston and Sherman had been doing most of the talking. Sherman had brought me as a guest, for I am not a member of the club, and probably never shall be. I think Cannes was also a guest. Both Sherman and Preston told me afterward that they had never seen him before.

I shall repeat his story as accurately as possible, as I

Late that same night I climbed into the box, heavily clothed, and with my head incased in an unbreakable transparent globe. An oxygen generator strapped on my back and connected by a tube to the headgear provided me with an exhilarating atmosphere." →



remember it, and I shall try to keep my own personal ideas and prejudices entirely out of the picture.

Cannes' opening and extraordinary statement was received first with silence and then with laughter. Preston asked him what he was talking about, and Cannes continued with an even more astounding remark.

"Gentlemen," he said, "I have cheated death by means of the fourth dimension. It is quite unusual that your conversation to-night should happen to be about the idea of traveling through time. I have done that very thing, and I just returned to the present at three o'clock this afternoon. There are many things about my experience that I fail to understand, just as a man in King Arthur's time would fail to understand an airplane, even if he could have ridden in one. As Mr. Sherman has pointed out, however, if I could understand twenty-ninth century science the seeming absurdities and impossibilities would explain themselves to me.

"I'll tell you the story if you want me to, and if you'll agree to refrain from making interruptions or wisecracks when you discover an apparent paradox or two. It is a matter of the utmost unimportance to me whether you believe it or not. I can't prove it. I destroyed the supporting evidence myself, for a very good reason. I doubt if I can make it convincing, but perhaps it will entertain you, and I think Mr. Preston will find it different from the 'formula' for time-traveling fiction, even though there is a pretty girl in it. My anachronistic love affair, however, was far from successful, ashamed though I am to admit it.

"About six months ago, Dr. Endicott Hawkinson called me on the phone and asked me to come over to his laboratory. Of course I went, for Hawkinson and I had been college chums, and I hadn't seen him for several months. You gentlemen remember perhaps the mysterious fire that destroyed the laboratory and killed him late last summer? His phone call summoned me thirty-three days before the fire occurred.

"He met me at the door. 'Cannes,' he said, 'what kind of an infernal hoax are you trying to put over on me now?' I didn't understand what he meant, and said as much. He was obviously puzzled.

" 'Didn't you write this?' he asked, showing me a sheaf of thirty pages of pale blue-tinted paper, closely written in longhand. 'I'd recognize that angular backhand script of yours any place,' he declared.

"I glanced through the manuscript. It was absolutely incomprehensible to me, as more than half of it consisted of intricate calculations, mathematical formulas, and equations that seemed to consist largely of Greek letters. The last ten pages contained some sort of complicated instructions, apparently for the manufacture of a large electrical machine. My college course had been academic and classical, while Endicott had specialized in mathematical physics and electricity. The stuff was as meaningless to me, as Morse code would be to a Japanese goldfish. I knew I had not written it, but the handwriting was undoubtedly a very good imitation of mine, I thought, particularly after I had closely examined the first line on the first page, which said 'To Dr. Endicott Hawkinson', and was written precisely as I would have done it. Furthermore, it was underlined twice, a little habit of mine. I tell you, gentlemen, I was puzzled. What motive could anyone have had for writing a sheaf of higher math, copying my handwriting in such a manner, and leaving the manuscript in the doctor's mailbox? When I eventually did discover the motive it was unusual indeed. More about that, later.

" 'What,' I inquired, 'is the meaning of this stuff?'

"His reply surprised and amused me. At that time, of course, I thought it was quite impossible to travel through time. But his sincerity impressed me as he told me that the manuscript apparently proved the existence of a fourth dimension, and furthermore showed the possibility of constructing a machine for projecting a body through the fourth dimension in much the same manner as we can throw a baseball through space.

" 'I have checked these computations twice,' he told me. 'If it is some fraud, some joke, some deception, there must be a fallacy in it somewhere. But I can find none. And you did not write it. After all, you couldn't have written it, Cannes! I'm almost convinced that it's genuine, after checking it twice, and you never went further than elementary algebra. But, then, who *could* have done it? If it's genuine it's the work of a genius. Why, then, would the genius give it to me? And that similarity of handwriting is remarkable——'

"He was wandering off into a maze of speculations, and seemed to forget me entirely. I left a few minutes later and heard nothing more from him until slightly more than a month had passed. He again called me on the phone with the startling news that he had been successful in constructing the four-dimensional machine. He asked me to come over immediately. I went.

"I am extremely foolish and impulsive by temperament, given to acting hastily without thinking. And so it is that I accepted the wild suggestion of Endicott Hawkinson to take a trip through time. But he didn't make the suggestion until he had demonstrated the machine to me.

"An odd-looking thing, that machine! That is, as much as I could see of it. Most of it was inside an enormous cabinet having a bakelite panel upon which were numerous switches and three dials. Eight heavy cables led from the bottom of the machine to the eight corners of a heavy cubical metallic box supported by four large vitreous insulators. The box was large enough to hold three men, and had a small trap-door in the top.

"I also noticed that Endicott had had a special power line installed by the electric lighting company.

"Endicott placed a large stone in the metal box and closed the trap-door. Then he threw five switches, halted to inspect something on the panel, and threw another switch, meanwhile watching his wrist watch. At the end of ten seconds he opened the switch again and told me to try to lift up the trap-door.

"Though he had not locked it, and it had been easily manageable a few minutes ago, all of my strength was now insufficient to lift it an inch. Hawkinson picked up an enormous crowbar and helped me pry the lid off. As soon as we had lifted it a trifle I was startled by a loud concussion and it came off easily. It was so hard to lift because there was an absolute vacuum within. After the air had rushed in, the lid was easily removable.

"I looked in. The undersized boulder had completely disappeared. I could see absolutely no explanation of the fact. The insulators supported the box a foot or more from the floor. The thirty-pound rock could not have passed through any one of the six sides of the hollow cube without becoming plainly visible to me. I was satisfied that I had not been deceived. The explanation leaped to my brain.

" 'It escaped through the fourth dimension?' I exploded incredulously.

" 'Precisely. It didn't escape in any of the other three, did it? A being living and thinking in only two dimensions could be imprisoned in a two-dimensional square. He couldn't escape without passing through one of its sides. But if he should discover the third dimension, if he should be able to travel in three-dimensional space, he could leave his plane and escape from his prison, and eventually return to his two-dimensional plane again, but outside the square. The analogy is simple. A being living in and knowing of only three dimensions, such as a man, can be imprisoned in a three-dimensional room. He can't escape without passing through one of its sides. But if he could travel into four-dimensional space, that is,

into time-space, no prison or dungeon in the world could hold him. He could later return to his own three-dimensional "plane," but outside the prison. You understand that? It's some of the most elementary four-dimensional geometry.'

" 'I was under the impression,' I replied, 'that four-dimensional geometry was entirely a theoretical, hypothetical science. You speak as if hyperspace and the fourth dimension had a concrete existence!'

" 'After what you have seen, Cannes, do you doubt that? Certainly the fourth dimension exists. Einstein and others have proven that it is time.* But we're three-dimensional beings, my friend. Our senses, our experience, our ideas, do not recognize duration as a dimension in the same manner as we think of length, width, and height. Time, to us, seems to be something else.'

"The doctor continued to speak in like manner for some time. To save time, gentlemen, I am going to omit the rest of his lecture. He fully convinced me that his machine radically changed electricity in some way that I cannot understand, for I do not know the difference between a transformer and a kilowatt-hour. I believe that, among other things, the frequency of the current was enormously increased, but I'm not sure of even that detail.

"Yes, gentlemen, I expected you to smile. It would be more convincing if I could be specific, wouldn't it? Never mind. Truth, you know, doth often wear the mask of fiction. If you think you are hearing lies, the worst is yet to come. And yet my story is cold and unadorned truth."

Cannes was perfectly at ease. What we thought of his narrative was nothing to him. He smoked a minute in silence before he resumed, and he was honored with complete and undivided attention.

"This altered current, gentlemen, had immensely different properties from those of electricity; and, by using the marvelous machine which he had constructed according to the specifications and directions in the pale blue manuscript, written in—well—in my handwriting, that had been mysteriously placed in his mail box, Dr. Hawkinson was able to send objects into the future by employing this current, which he called the time-wave.

"So far, we had not discovered a single trace of the writer of the paper. I discovered him later, one thousand and two years later, to be exact. For I went into the future.

"I don't know yet just what was the fascination that urged me to do such a thing. I said that I am impulsive, hot-headed, foolishly short-sighted, and impetuous. I had no relatives to keep me home, and I longed for the strange adventure. I never thought about getting back. And Hawkinson wanted knowledge of the future. He said that certain statements in the manuscript had convinced him that living beings were not harmed by the process, and that he hoped I would eventually find a means to return to him, though there was positively nothing in the manuscript to indicate that the process could be reversed. It concerned itself only with entering future time.

"So, late that same night, before my impulsive decision had had a chance to cool, I climbed into the box, heavily clothed, and with my head incased in an unbreakable transparent globe. An oxygen generator strapped on my back and connected by a tube to the headgear provided me with an exhilarating atmosphere, though I don't understand the precise reason for the outfit being necessary.

"I saw Hawkinson's face as he closed the lid, and suddenly I wanted to turn back. And I'm sure he did, too. But we went through with it. Death came to him soon after, but because of that experiment I have cheated death.

"I was in the box only about ten seconds before I had a sensation as if I were rising with ever-increasing speed through a perfectly black void. I could see nothing, I was very cold, and the sensation of motion became greater and greater. Then something clicked three times, and my journey was ended.

"I did not learn, until I returned to the present at three o'clock this very afternoon, that Hawkinson had been killed. Some faulty insulation somewhere had permitted a short circuit between his house-lighting system and his special line. The frame house and laboratory took fire and burned, and somehow he was trapped in it. This must have happened only an hour or so after I left him, according to what I learned a few hours ago by telephonic conversation with his family. At least, the accident did not occur after the doctor had finished sending me into the future, for I arrived all right.

"As soon as I heard the three clicks, I perceived that I was standing erect in a room with brilliant crimson walls. There were windows at one side that permitted sunlight to enter. And there were two men present, each seated in a comfortable chair. One would think that my sudden appearance would cause some surprise or astonishment to men of the future. But the individual at my left, in a most commonplace tone of voice, merely made a remark to the other that to me was nothing less than astounding.

" 'Here's another anachronism,' he said. 'They're getting to be a damned nuisance.'

In the Year 2930

I REMOVED the transparent globe from my head and addressed the nearer man, inquiring where I was in space and time.

" 'You are in district 700254 of New York, and the date is August 2, 2930.' The accent of the man was peculiarly nasal, but his words were clearly understandable, although I had traveled one thousand and two years and some odd months, weeks, days, hours, minutes, and seconds into the future. In those thousand years the English language had altered less than it had in the two hundred years preceding. This, I later learned, was due to the adoption of printing to an ever-increasing extent, which had served to fix or standardize the language. Of course, an enormous number of words had become obsolete and multitudes more had been coined. But I never had any great difficulty in conversing with my friends in that distant era.

"Before I had much time to marvel that I had passed through ten centuries in what had seemed like so many seconds the man of the future was addressing me again.

" 'It is requested,' said he, 'that all persons visiting this era from the past be sent to Dwar Bonn's laboratories in Australia. The government of the world has employed Bonn to compile as accurate a history as possible of the last two hundred years—the period since the second Martio-Tellurian War. You will doubtless be able to give him some useful information about the year you left to come here, and the period previous to that.'

"My head was in a whirl. 'A laboratory,' I interposed, 'for writing a history?'

" 'The history,' he answered, 'is only one of the thousands of things Bonn and his assistants are taking care of. Not one laboratory. Three hundred. Bonn has been the world's greatest scientist since the death of Dwar Smit. You know of *him*, of course?'

* Transcriber's note. There is some mistake here, either in the late Dr. Hawkinson's discussion with Cannes, or in Cannes' narration of said discussion to the club. Einstein's theory has not been "proven," yet, unless Cannes' story is accepted as truth, which is impossible because of the lack of supporting evidence. This is one of the many mysterious details connected with Cannes' story; in fact, one of the club members later expressed a belief that Cannes was lying from beginning to end, and had here betrayed himself, for it seems unlikely that a man with Hawkinson's scientific reputation would have made such an erroneous statement. Hawkinson is dead. However, it has been ascertained that he *did* have a private power line installed in his laboratory precisely thirty-three days before the fatal fire that destroyed the laboratory and all its contents. And Cannes *was* known to have been an intimate friend of the scientist.

" 'No.'

" 'How could you have come here, employing his invention, without knowing of him?' Unveiled suspicion was in the eyes and the tone of my questioner. He pressed a button or switch that I didn't see very plainly, for it was behind him on the top of a table. I must have lost consciousness, for the next thing I remember is sitting upright and finding myself to be the sole occupant of a small airplane, high above the earth, rushing through space without visible control at a rate of exactly 1000 kilometers, about 621 miles, an hour, if the speed indicator in front of my face was correct.

"I could not see the earth, for a heavy uniform layer of clouds was below me. I later learned that they were completely under the control of man, and that the agricultural region over which I was passing was receiving its daily four o'clock rain.

"I marveled that I felt no motion. Only by looking out through the thick glass windows at either side of my enclosed compartment at the rushing clouds below could I realize that I was moving. I reasoned that I must be going in an absolutely straight line, for I knew that in 1928, when racing aviators made turns at more than three hundred miles an hour they lost consciousness for a moment.

"But I found out in a few minutes that there was something wrong with my conclusions. With a suddenness that startled me, the clouds were passed, and I was high above an ocean. Far off to my left, traveling at great speed, and in a direction that showed its course would intersect mine, was approaching a colossal monotriplane, three streamlined wings behind one another supporting a fuselage larger than the Leviathan. I found out later that seventy or eighty thousand ton air freighters and passenger planes were common. I experienced a very real fear in the few seconds it took for that flying city to approach the tiny plane in which I was, to all intents and purposes, a prisoner.

"When it seemed that a collision was inevitable, something clicked on the instrument board before me, and my plane soared over the other without decreasing speed in the slightest. And only by my eyes did I know that I was moving. Somehow, in the planes of the thirtieth century, inertia and centrifugal force had been nullified so that I could turn sharp corners at six hundred miles an hour and not know it if I had my eyes shut!

"Almost three hours later the little plane, having successfully dodged automatically several dozen others of all sizes and types, glided down to the roofdrome of a skyscraper something more than half a mile high. The door of the plane snapped open, and as I stepped out I was greeted by no less a person than Dwar Bonn, greatest living scientist of the era. I had been shipped to his Australia headquarters by automatic airplane delivery service.

"Bonn introduced himself, took me to an elevator, closed the door, and five seconds later opened it again some hundred and fifty stories lower in the building. I did not feel the descent, nor even the jerk that must have taken place when we stopped. Bonn conducted me to a room whose walls were a brilliant scarlet. Why they were so, I haven't the slightest idea. When we had been comfortably seated, he explained:

" 'Your appearance, Mr. Cannes, has given us an enormous amount of valuable and interesting information about the twentieth century. You were rather foolishly suspected to be a dangerous character by a couple of business men' (his tone held a marked contempt) 'whom you interrupted in the midst of an important business conference. The world has lately been excited by the announcement of an Egyptian scientist that a method of producing true invisibility has been discovered. The men, seeing that you were not wearing the time-traveling apparatus that is usually worn by people coming from the past, and hearing your statement that you did not know of Dwar Smit, discoverer of the NN-4 wave, rather stupidly jumped to the conclusion that you were perhaps just an invisible intruder who had been spying on their affairs, so they rendered you unconscious by using a very common hypnotic apparatus that may be purchased anywhere, although it is not generally used for such purposes.

" 'A few minutes' reflection and an examination of you showed them their mistake, so they got in touch with my New York representatives. The latter hooked you up to another hypnotic machine, and your brain, if I may use the simile, was turned upside down like a bag of information. So you have already disclosed to me everything you know about your civilization and your former life.

" 'You have been a particularly interesting case, and you have corrected many erroneous ideas we have held about your time. You are the first man to come to us from a time previous to the year 2806, when Dwar Smit discovered the NN-4 wave. You traveled through time before the system of time-traveling was ever invented. Your friend found a mysterious manuscript, we discovered when we read your brain. This manuscript gave specific directions for the construction of a machine identical with the earliest crude one made in 2806 by Dwar Smit.

" 'There is only one explanation. Someone, sometime later than 2806, copied Dwar Smit's earliest calculations and directions, *traveled back through time,* and left them in your friend's mail box. Dr. Hawkinson could therefore copy a machine that was not really made until centuries after his death! It sounds almost incredible at first. It's what *you* might call a paradox.

" 'But understand this, Cannes. Although he tried all his long life, Dwar Smit did not invent a machine for *traveling back through time.* He was never able to do anything but send people and objects into the future. And most of to-day's scientific minds believe that traveling into the past, traveling negatively through the fourth dimension, is impossible. I have not held that belief, for many reasons, the most understandable of which to you is the fact that one can travel in either direction through any of the other three dimensions.

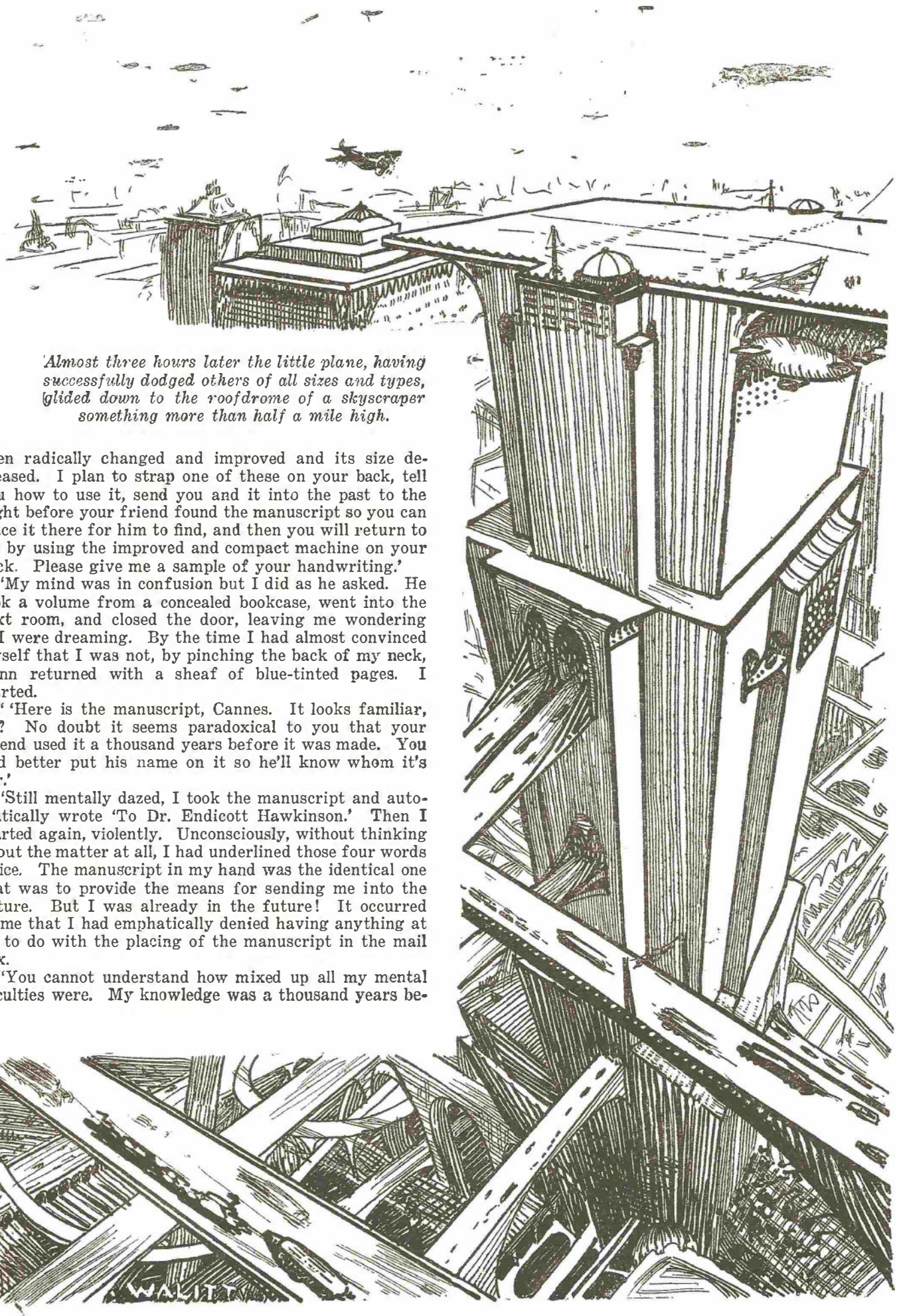
" 'Three days ago I completed a machine that I believe will enable me to send objects back through time. When I learned of your arrival I was greatly excited, for in a way you are evidence that my machine will work. Let me explain.

" 'The manuscript Dr. Hawkinson found was in your handwriting. You are now existing in the year 2930, more than a hundred years since Smit invented the machine for utilizing the NN-4 wave. What is to prevent you from copying his work, traveling back through time to the night before Hawkinson found the manuscript, and placing it in his mail box? The fact that the manuscript was placed there shows that you will be successful in placing it there!'

" 'I doubt if I could copy such calculations accurately. I might make a mistake.'

" 'Don't let that worry you. I have a clerical machine in the next room that can do that. It is often used to make translations and for the writing of certain complex hieroscript codes I use for private records. The codes are undecipherable except by machine and cannot be written by the ordinary dictaphono-printer, which anyway is not equipped with the mathematical symbols necessary. This clerical machine of mine will examine, photoelectrically, any small sample of your handwriting and, in somewhat the same way as it translates messages from one language to another, it will copy the calculations and specifications in Smit's book, putting them on paper in a very close approximation of your handwriting.

" 'Since Smit's invention of his time machine it has



Almost three hours later the little plane, having successfully dodged others of all sizes and types, glided down to the roofdrome of a skyscraper something more than half a mile high.

been radically changed and improved and its size decreased. I plan to strap one of these on your back, tell you how to use it, send you and it into the past to the night before your friend found the manuscript so you can place it there for him to find, and then you will return to me by using the improved and compact machine on your back. Please give me a sample of your handwriting.'

"My mind was in confusion but I did as he asked. He took a volume from a concealed bookcase, went into the next room, and closed the door, leaving me wondering if I were dreaming. By the time I had almost convinced myself that I was not, by pinching the back of my neck, Bonn returned with a sheaf of blue-tinted pages. I started.

" 'Here is the manuscript, Cannes. It looks familiar, eh? No doubt it seems paradoxical to you that your friend used it a thousand years before it was made. You had better put his name on it so he'll know whom it's for.'

"Still mentally dazed, I took the manuscript and automatically wrote 'To Dr. Endicott Hawkinson.' Then I started again, violently. Unconsciously, without thinking about the matter at all, I had underlined those four words twice. The manuscript in my hand was the identical one that was to provide the means for sending me into the future. But I was already in the future! It occurred to me that I had emphatically denied having anything at all to do with the placing of the manuscript in the mail box.

"You cannot understand how mixed up all my mental faculties were. My knowledge was a thousand years be-

hind the times, and I could not begin to understand the things I saw happen.

"Gentlemen, I am going to omit details. It is becoming late and there is another part of this story I want to tell. Suffice it to say that I was transported into the past farther than I had come into the future! I placed the manuscript in the doctor's mail box. But before I did this I had to walk a mile, for I had arrived that far away from his house. While I was walking, my mind cleared. Because this manuscript had been found by the doctor, I reasoned, I had been able to go to 2930. But also, only because I had gone to 2930 had the manuscript come into being. Which was the cause and which was the effect? That is a paradox I cannot explain. A thousand years from now it will be understandable and common to the people of the world.

"I started reasoning along another line. Suppose I should have traveled into the past to the time when my grandfather had been a little boy. If I were so inclined, I could kill my grandfather before he had had a chance to meet my grandmother, thereby depriving myself of the privilege of being born! But the fact that I was present to kill my unfortunate grandfather would show that I *had* been born. Therefore, I could not have killed my grandfather. It was hopeless.

"The most intelligent man in the world in 1428 could have proven to his entire satisfaction that such a thing as radio was scientifically and logically impossible; yet we have radio to-day. I actually convinced myself that time-traveling was logically and scientifically nothing but the utterest nonsensical paradox; yet I delivered the manuscript as per Bonn's instructions.

"Then, still following instructions, I returned to the exact point at which I had arrived from the year 2930. As I returned I wondered what would have happened if I had thrown the manuscript into the river, instead of putting it in the mail box. Hawkinson, next morning, would never have found it, and therefore could never have sent me into the future. But unless he had found it and sent me into the future, I could never have had the manuscript to throw into the river. However, I seemed to think that throwing the manuscript into the river would be deliberately cheating fate. So I had delivered it.

"Later, when my life was at stake, I deliberately did cheat fate. That's why I'm here now. My death was scheduled for yesterday. I'll explain that later on.

"I stood near the river, ready to follow Bonn's final instructions. I was to press a button in the belt that helped to support the complex improved time-machine on my back. I was ready to return to Bonn and tell him that the experiment was a success, that his invention had functioned as well in sending me back through the fourth dimension as the other had in sending me into the future. I was ready to return to Dwar Bonn. But suddenly I hesitated. Why should I go back into the future? Nothing compelled me to comply with Bonn's request. I had not even promised him to return. He had taken it for granted that I would. If it had not been for that aversion I then had for the thought of cheating fate, I think that then and there, I would have taken off the portable machine and thrown it into the river.

"Another thought occurred to me. The night before Hawkinson had called me on the phone I had been sleeping peacefully in my Lansdowne apartment. Undoubtedly I was sleeping there peacefully that very second, for I had traveled back through time to that same night. Then, if I should throw the machine into the river, there was nothing in the world to stop me from going over to Lansdowne and waking myself up. The idea fascinated me. It occurred to me that I would have a hard time convincing myself that I was I. Suddenly I started again. *It was a scientific impossibility for a man to be in two places at the same time.* But I was.

"Another paradox. I then determined that I should return to 2930 and have Dwar Bonn explain things to me. So I pressed the button in my belt. The 7.6 grams of 'solid electricity' in the generator of the outfit on my back was changed from matter into energy, producing a powerful current, which was transformed into what Bonn always called the NN-4 wave by the apparatus on my back, and I rose through the fourth dimension once more. I found Bonn smiling as I suddenly appeared in the laboratory, hardly a foot from the point from which I had started.

"'It is a success,' he said. 'You've been gone thirteen seconds!'

"A short while later I requested him to explain to me the seeming paradoxes connected with time-traveling. And he did! He explained them fully. He explained them logically and painstakingly. He explained them as simply as he could, but the cold fact remained that my brain was a thousand years behind his. (I defy any scientist of to-day to write an explanation of the talking movies that would be understandable to a man living in the tenth century.) Bonn finally decided to stop trying. He told me that if I decided to remain in that era of time, he would arrange for me to be hypnotically educated by machines built for that purpose, though my brain would probably not be capable even then of comprehending the abstruse science behind that seeming paradox. For a long time I puzzled over myself and the hypothetical murder of my innocent grandfather, but it remained, and remains yet, an endless circle to me.

"There was another endless circle connected with my experience in the years to come, but it was perhaps a trifle more easily understandable. I met a girl and loved her with a love that was never requited. The more I loved her the more I wanted to be with her, and the more I was with her the more I loved her. But she never thought of me as anything more than a scientific curiosity, one of many living anachronisms. Traveling into the future had become almost common after Smit's invention of the time-machine in 2806. Yet it was because of that girl that I cheated the grim reaper in 2930, and then gypped him again in 1928. I really have no right to be alive now.

The Invisible Spy

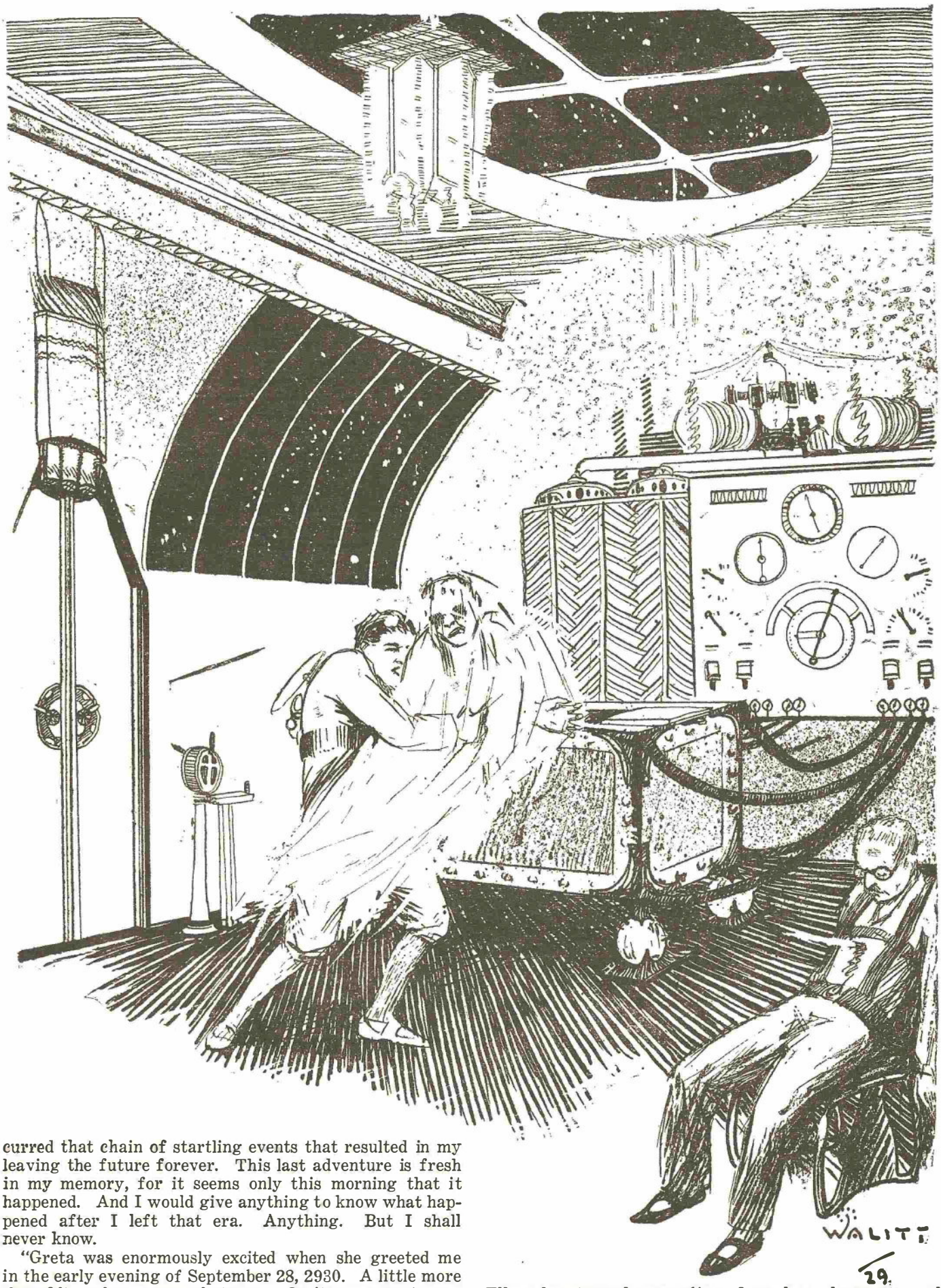
"SHE was Greta Bonn, the scientist's only child, slender, brown-eyed, adorable.

"Gentlemen, I feel like a particularly silly fool to sit here and tell you that I fell hopelessly in love with a girl who doesn't exist, and won't exist until ten long centuries have passed. Perhaps one should not speak of the affairs of one's heart, even if one is heartbroken. No, I'm not joking with you——

"Dwar Bonn had invited me to be his guest, for in a small way I had helped him to realize one of his life's ambitions, that of sending objects into the past. For the first month or so after my arrival I spent all of my time learning about and trying to comprehend the highly involved and complicated civilization of the period after the second great interplanetary war. And I learned something of the history of the world, something about the unspeakable horror of those two wars, of the time when three-quarters of the world's population were killed in one day——

"Greta Bonn instructed me in many things, and I was happy to have her as my tutor. Perhaps the happiest month of my life passed in that great laboratory in Australia, and slowly I awoke to the realization that I, an anachronism by a thousand years, was madly in love with the daughter of him who had earned the title of world's greatest scientist.

"But my month passed, and in a few short hours oc-



When he stopped struggling, I made a desperate and unexpectedly successful attempt to rip his unseen covering from him. I jerked at it, tearing it, which apparently rendered it useless.

curred that chain of startling events that resulted in my leaving the future forever. This last adventure is fresh in my memory, for it seems only this morning that it happened. And I would give anything to know what happened after I left that era. Anything. But I shall never know.

"Greta was enormously excited when she greeted me in the early evening of September 28, 2930. A little more than fifteen hours ago, that was. Or it seems so to me.

"She had found relatives of mine, descendants of my brother, who were living in California, and had talked to them by radio. And in old records the family pos-

sessed, my birth and death were listed, together with the notation that I had fought in the First World War and had been wounded. Yet it was a terrible blow to me to find out that my old and dignified family name had been phonetically altered to Canz.

"But the most interesting thing to me was the date and the manner of my death. In the family records no mention was made of my traveling through the fourth dimension. I have never informed my relatives about it. But it was stated that I had been killed by a motor truck on October 7, 1928.

"Before I could grasp the full significance of this fact Dwar Bonn appeared and told Greta and me that he was going to New York on the new monster plane *Patrician*, and invited us to accompany him. I accepted, of course, for I was eager to see the enormous metropolis, and Greta went along because she had some girl-friends in the city and was getting tired of visiting them by television only.

"A few hours later the three of us were sitting in our private parlor aboard the *Patrician*. Bonn told me that in the past month he had been improving and reducing the size of his newest invention, so that it took up only a trifle more space than did the portable machine of Dwar Smit's that I had used. After he had mastered the principle, he said, it was easy for him to improve the details and eliminate unnecessary bulk and weight, in much the same manner as Dwar Smit's machine had been gradually improved. He was taking this new machine to New York for a private demonstration to some of his personal friends and colleagues.

"In some manner or other the discussion turned to atoms, and Bonn tried vainly for a while to explain to me the latest theory about the structure of the universe. In the early twentieth century, he stated, men believed that everything was made from some ninety-two or so different kinds of atoms, which were supposedly indivisible. Then later it was learned that the entire universe, including the atoms, was made up of only three different things, the electron, the proton, and the photon, or light-corpuscle. For you know, gentlemen, that even today it is recognized that there are facts that the wave-theory of light cannot explain. Bonn told me that in some of his researches and experiments concerning transmutation (the simple process of adding or removing a few electrons and protons from one kind of atom to make of it another variety), he had found evidence that had convinced him that the electron, the proton, and the photon were different manifestations of one and the same thing——

"Human nature had not altered very much. The discussion was old stuff to Greta, and it visibly bored her. She rose and went out on the deck, and I soon excused myself and followed her, for I could grasp very little of what Bonn was saying. I had been under the impression that protons and electrons were positive and negative charges of electricity. And the photon was a new one to me. Besides, I was much more fascinated by Greta than by the speculative physics of the thirtieth century A. D.

"The thousand years had made little impression on the moon. As the plane sped along, vibrationless at the incredible speed of 1200 kilometers an hour, I could see through the transparent roof of the upper deck the full moon, tinted a vivid orange by some atmospheric condition or other. Once before, in 1927, on the Rappahannock River, had I seen such a moon. To me it was a link with the past.

"I found Greta at the extreme front of the 3000-foot fuselage, on the topmost deck, which was covered over by a transparent, unbreakable, glass-like metal or alloy of some kind, hard as steel. She was standing in the gentle breeze that emerged from one of the great ventilators, apparently lost in contemplation of the stars. Through the transparent roof I could hear faintly the hundred high-pitched whistles made by the air as the *Patrician* hurtled through it more than twelve miles a minute.

"Her hair was like spun gold in the moonlight. My love for her came to the surface, my impulsive, temperamental nature asserted itself once more. I took her in my arms and kissed her, but there was no answer in her lips.

"And then the fireworks started. I truly believe, if she had had a firearm of any kind, she would have gladly shot me dead. Never have I beheld anyone so mad, so outraged. Having no suitable deadly weapon at hand, she attacked me with her fists. I stood still and took all she gave me. I couldn't run away, could I? I couldn't strike her, could I? And I couldn't reason with her. She was doing all of the talking. I won't repeat what she said. I gathered from it that she was disgusted with me, that she utterly hated, loathed, and despised me; that she would be greatly pleased if she never saw me again. For it is evident to me that a kiss, in 2930, was a much more significant thing than it is now, and Greta's indignation knew no bounds. None whatsoever.

"While she was wildly attacking me, her fist happened to strike one of the two metal disks, six inches in diameter and an inch thick, that were attached to the shoulders of the coat I had been given to wear, and in some way snapped it off the rod that supported it an inch above my shoulder. The blow must have hurt her hand cruelly. The metal disk fell into the ventilator. I presume it went out at the other end and fell to the earth. I don't know.

"I had noticed that everyone I had seen on the plane, including Bonn and Greta, had two of these disks attached to his or her shoulders, but I had not given the matter any thought. I was used to seeing things I couldn't understand.

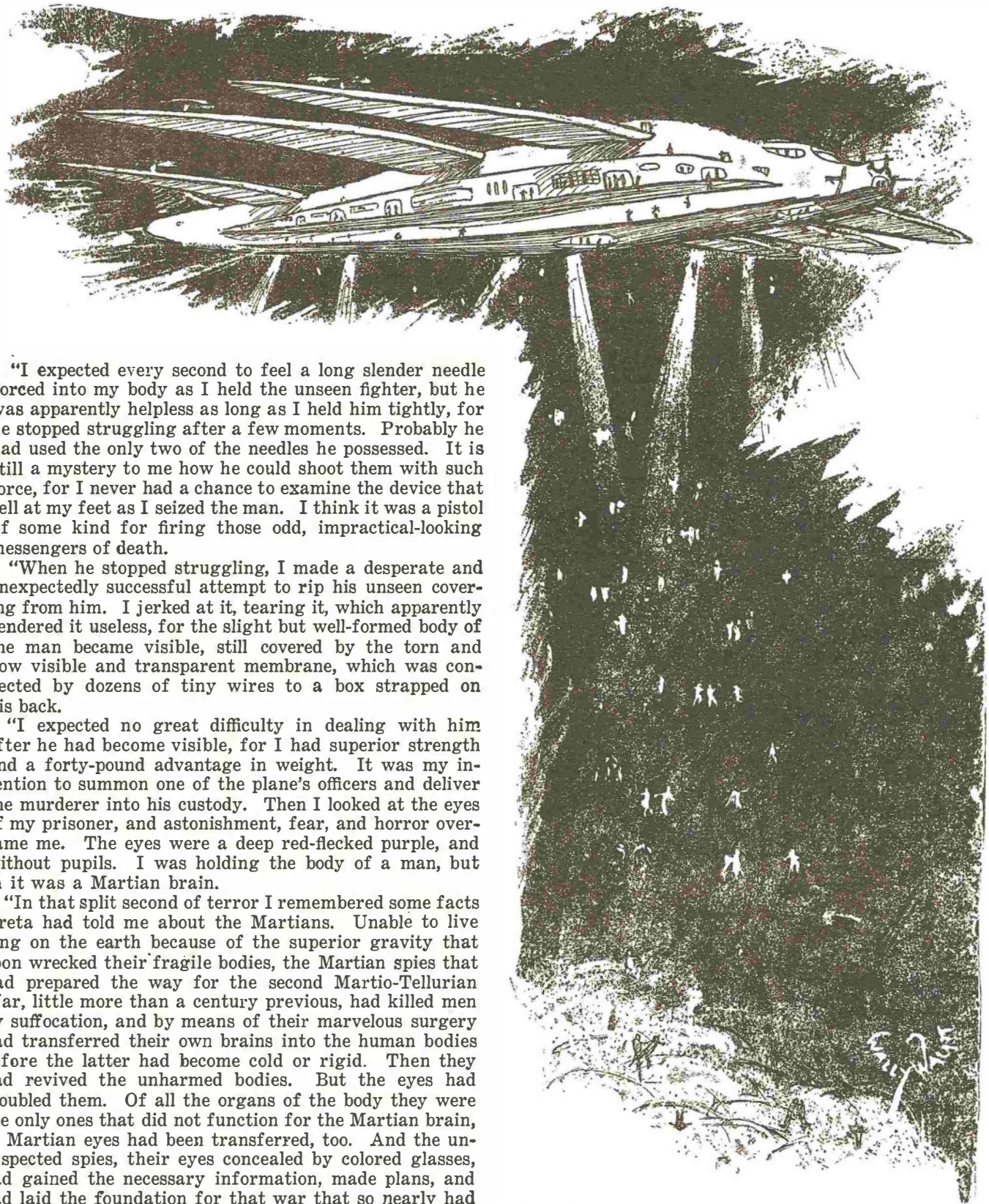
"When the girl's fit of temper was finally over she turned and walked stiffly away. I stayed where I was and looked at the orange moon, meanwhile bitterly cursing my luck. When I had cooled down a little, I realized that the only thing I could do was to go to her and to her father, apologize for my actions, and explain that I had intended no harm, asking their forgiveness on the ground that I was still unfamiliar with the customs of the time, and had foolishly let my emotions get the better of me.

"When I re-entered the room in which I had left Dwar Bonn, he was sitting upright in his chair, dead. Through his heart, projecting ten inches from both his back and his chest, was a heavy steel needle, pointed at both ends, a perfectly hellish weapon.

"I thought I heard a noise in the corner of the room, but I saw nothing there except the large chest in which was Bonn's latest and greatest invention, the machine for traveling back through the fourth dimension. Then I was positive I heard a slight noise in that corner of the room. I took a couple of steps forward.

"Something shrieked past my ear. I heard a thud behind me and turned involuntarily. Protruding from the metal wall was another long metal needle, quivering. Suddenly I recalled the words of Dwar Bonn. 'The world has lately been excited by the announcement of an Egyptian scientist that a method for producing true invisibility has been discovered,' he had told me. Instinctively I acted. I hurled myself toward the chest in the corner.

"I could feel my arms encircle the body of a man, but could see nothing. He who struggled in my arms was completely covered by a soft flexible gelatinous garment that in some manner caused light to pass around him as water flows around a submarine, as air flows around the streamlined fuselage of a plane. It was not transparency, or partial invisibility, or an optical illusion that I had to deal with. I saw around the killer of Bonn, but my eye could perceive no evidence of his existence.



"I expected every second to feel a long slender needle forced into my body as I held the unseen fighter, but he was apparently helpless as long as I held him tightly, for he stopped struggling after a few moments. Probably he had used the only two of the needles he possessed. It is still a mystery to me how he could shoot them with such force, for I never had a chance to examine the device that fell at my feet as I seized the man. I think it was a pistol of some kind for firing those odd, impractical-looking messengers of death.

"When he stopped struggling, I made a desperate and unexpectedly successful attempt to rip his unseen covering from him. I jerked at it, tearing it, which apparently rendered it useless, for the slight but well-formed body of the man became visible, still covered by the torn and now visible and transparent membrane, which was connected by dozens of tiny wires to a box strapped on his back.

"I expected no great difficulty in dealing with him after he had become visible, for I had superior strength and a forty-pound advantage in weight. It was my intention to summon one of the plane's officers and deliver the murderer into his custody. Then I looked at the eyes of my prisoner, and astonishment, fear, and horror overcame me. The eyes were a deep red-flecked purple, and without pupils. I was holding the body of a man, but in it was a Martian brain.

"In that split second of terror I remembered some facts Greta had told me about the Martians. Unable to live long on the earth because of the superior gravity that soon wrecked their fragile bodies, the Martian spies that had prepared the way for the second Martio-Tellurian War, little more than a century previous, had killed men by suffocation, and by means of their marvelous surgery had transferred their own brains into the human bodies before the latter had become cold or rigid. Then they had revived the unharmed bodies. But the eyes had troubled them. Of all the organs of the body they were the only ones that did not function for the Martian brain, so Martian eyes had been transferred, too. And the unsuspected spies, their eyes concealed by colored glasses, had gained the necessary information, made plans, and had laid the foundation for that war that so nearly had eliminated mankind.

"Now, for the first time in a hundred years, another Martian spy was on the earth. I was startled by the revelation. A sudden fear came to me that perhaps the Martian was hypnotizing me now, that soon I would be under his power. But that did not come to pass. Though tremendously advanced in some lines of science, the Martians had practically neglected the possibilities of the psychological sciences. My will was stronger than my prisoner's.

"But he took advantage of my moment of surprised terror and broke away by a sudden effort. He rushed for the door, threw it open, and would have been gone, had he not collided with Greta Bonn. In that second I recaptured him. Greta saw the eyes, her slain father, the needle in the wall, and acted. She called the captain of the plane at once on the phone. The latter tuned his televisor on the room, took one rapid glance at the situation, and sent an armed officer with several men to our parlor immediately. They bound the Martian securely

All of the doors and windows were opened, and I was amazed to see hundreds upon hundreds of people calmly jumping off into the night.

and then questioned him. He remained stolidly silent, unashamed hate in the flashing purplish eyes.

"Seeing that the Martian had not the slightest intention of saying a word, the officer employed a little hypnotic machine to force a confession, the same type of machine, I believe, that had rendered me unconscious in New York, and which had numerous other uses. This is what the Martian said:

" 'In three days not a terrestrial will remain alive. You have captured me, you may spread the news, but you will not escape. This plane is doomed. You do not know that many tons of Martian *brarron* are aboard. In your cargo-rooms are crates labeled "merchandise" that contain only our explosive. You terrestrials have been careless. The few Martians left alive after the last war have watched you from afar and have waited. Through space we have come to your South Polar lands and taken on our hideous disguise of "human" flesh. In fifteen minutes we strike! The *brarron* on this plane is only a very small part of the quantity distributed over your world, at its most densely populated parts. Fifteen minutes from now the station at the South Pole will broadcast over the world a wave that no man-made interference can drown out. All of the *brarron* in the world will be detonated then. You have forced me to tell you this but you are too late to save yourselves. Yesterday I stole the device of a terrestrial of Egypt, a thing that let me come here unseen. I regret that I was not able to take this new invention of the dead man in the chair; it would have been useful to us. I would have escaped from this death-laden plane and taken both of these valuable things to my superior. But it does not matter much. In three days not a terrestrial will exist!'

"The hypnotic machine disclosed that he was telling the truth about the cargo of explosive and the station at the South Pole. There were only fifteen minutes left in which to escape from the plane before it would be blown to atoms. I remembered what I had heard about the Martian explosive *brarron,* its unearthly power of destruction. Men had never been able to analyze the samples that had fallen into their hands at the end of the previous war. All that was known was that it contained some compounds of nitrogen and that it could be detonated easily by certain etheric waves.

"There was not time enough to maneuver the enormous plane down to earth in the night in a place unfamiliar to the officers and not suited as a landing field. Like an enormous ocean liner the great plane was difficult to handle at its terminals. And I think that at that time it was over the Pacific Ocean, for the journey had lasted only two and one-half hours so far, and the plane could not yet have crossed the Pacific entirely at its rate of speed. However, so much artificial land had been produced in the preceding centuries that we may have been over dry land. But that is unimportant. It would have been highly foolish for the officers to have attempted a landing in the short time available. Nor could the great amount of cargo be removed. The captain of the *Patrician* did the best thing he could possibly have done. Instructing his radio operator to spread the news to all the world on the emergency wave, he gave orders for the hurtling plane to come to a full stop. It slowed and stopped motionless in the night air, supported by its ten large four-bladed helicopters. Then he gave the order to abandon the plane. All of the doors and windows were opened, and I was amazed to see hundreds upon hundreds of people calmly jumping off into the night. As I was wondering, I saw Greta beside me.

" 'Cannes,' she said, 'I broke your life-disks. Take mine, and jump.' Her tone was cold, impersonal. She began to unbutton the coat she was wearing. Then I comprehended the purpose of the two disks worn by everyone on the plane. In case of disaster they acted as parachutes, in some way extracting power from the supply that was always being broadcast for public use, and using that power to break the fall.

"I looked at the stern-faced girl beside me. She hated me, despised me, but because she had broken my disks, she was offering me hers. Why? Because it was her code of honor, of sportsmanship. With an unbroken pair of disks I could live, at least for a while. Without them I was sure of death. She held herself responsible for the destruction of my means of escape, so she offered me hers, urging me to take them as there were no others obtainable in time, although some were stored in another part of the plane. Because everyone was obliged by law to wear a pair of disks, the ones on the plane had not been stored very accessibly.

"She would not listen to my refusal. She told me, when I asked, that one pair of disks could not possibly support the two of us, that they would snap under a strain they were not designed for, and drop us to a quick death below. She told me she preferred to die on the plane where her father had been killed, and that she would not be so dishonorable as to leave me to my death after she had broken my disks. It was useless for me to tell her that I had only myself to blame for my predicament, that her attack was justified, that I should not have kissed her. We wasted four precious minutes arguing.

"Then all my love and admiration for the stubborn, brave, beautiful girl who would not save her life against her code of honor came surging up from my heart. I seized her, rebuttoned the coat she had almost removed to give to me, picked her up in my arms disregardful of her struggles, kissed her forehead, and threw her out into the night.

"The orange moon was still above. For a few seconds I saw her face as she sunk out of sight, and momentarily at least out of danger, too. For it was six minutes yet before the explosion would occur, and by that time she would have fallen far enough to be safe, unless some murderous piece of the wreckage should happen by the merest chance to strike her as she fell——

"I saw her face for a second or two, a second or two that are burnt into my memory, never to be erased. And yet I cannot interpret the expression I saw there. Certainly some of the anger was gone, some of the steely hardness. After all, in spite of her outraged feelings, had my kiss aroused something in her heart that responded to my great love for her? Had she insisted so strongly on my taking the disks partially because she did care a little? I'm afraid not. She was as cold as steel. Yet those last two seconds there was something in her face that—I wish to God I knew what it was.

"When she had fallen out of sight I began to think seriously about my own safety. I had no disks, I did not know where any were stored, and I couldn't search the whole gigantic plane in five minutes. Though I was, as far as I knew, the only person left aboard, the helicopters were still running smoothly, the plane was hovering motionless in the air. The controls had been locked. The plane would not move until the world-wide explosion took place. Five minutes!

"Then I remembered the machine in the chest, Bonn's machine for traveling back through time. Feverishly I rushed to the parlor where the three of us had been discussing atoms only a short hour previous. I opened the box and lifted out the machine, strapping it hastily on my back. It was very heavy and cumbersome, but that didn't bother me. I saw two dials on the belt that strapped around my waist which could be adjusted to indicate any latitude and longitude. I set them to about 39°50′ North and 75°10′ West, respectively, which was as close as I remembered the location of Philadelphia. Another set of dials could be arranged to indicate any day since 2000 B. C. up to 2930 A. D.

"But suddenly I recalled that according to the old family records I had been killed by a motor truck on October 7, 1928. I didn't want to return to the day before my death was scheduled and be killed the next day. I had puzzled so much about the seeming paradoxes of travelling through time that I had lost all repulsion to the idea of cheating fate. I decided that, no matter how impossible it seemed, I was deliberately going to cheat death. Though I did not understand the science involved, Dwar Bonn had told me that such a thing was not at all impossible. So I set the dials for today, October the *eighth,* 1928. You gentlemen understand now what I meant when I said I had gypped the grim reaper. In other words, I was late to my own funeral! I did not return to October 7, yesterday, *so I was not present to be run over by a truck.*

"When I had finally adjusted the dials my wrist watch told me that there was only one minute left. I pressed the button. Everything went black, and I had a sensation as if I were falling, plunging into a void. You understand that I was not really falling, but that was the way my brain, unaccustomed to motion through the fourth dimension, interpreted it.

"When I arrived in the present, through some trifling inaccuracy, I arrived four feet up in the air instead of on the surface of the earth, so I did a little real falling. When I picked myself up, the time-machine was hopelessly smashed. I recognized the Delaware River nearby, and realized that I had landed several miles north of Philadelphia. I threw the smashed machine into the river, thereby destroying the one shred of evidence I had that the adventure had really happened. You see, a few hours ago, I decided that I would never disclose my story to anyone. I changed my mind when I heard your discussion. I could not resist the temptation to tell what had happened to me, even though you will not believe a word——

"I walked to the nearest highway. A kind-hearted motorist gave me a lift to Lansdowne. During my absence, my apartment had not been re-rented. I obtained a key from my landlord, entered again the rooms I call home, and changed into some clothes not so conspicuous as my thirtieth century costume. Later I met a friend, attended an afternoon church service in Philadelphia, and later dropped in here.

"You are under no obligation to believe a word of it, but I shall state again that it was not a dream, that it really happened to me; that is, it will happen to me a thousand and two years from now.

"I rather wish I knew whether or not the Martians did annihilate the human race in those three days. I would give my life to know what happened to Greta. But Hawkinson is dead, and the manuscript was destroyed in the flames. It's a paradox, gentlemen, but it's true. Good evening."

The spell was broken.

A Disastrous Mistake

RAYMOND CANNES moved into the next room, picked up a magazine, and sat down in an armchair where we could see him through the doorway. He did it, I think, for no other reason than to give us a chance to discuss his story freely. Until he walked away none of us realized how intently we had been listening to him. Preston laughed.

"Clever," he said. "Almost infernally clever. Are you convinced now, Sherman, that time-traveling is impossible? That fellow has brought out clearly in his tale the reasons why it is absurd to think of going into the past or the future. I've heard that grandfather argument before. It alone is enough to show the fallacy in the whole fantastic idea. Our friend Cannes is a satirist of no little ability. I'll have to cultivate his acquaintance."

Sherman did not say anything for a long moment. Then he stated slowly and seriously, "Regardless of what you say or think, Preston, I do believe that he was telling the truth, that far from demonstrating the impossibility of time-traveling he has shown conclusively that it is possible, even if there are confusing and mysterious circumstances connected with the process. I'll swear he was sincere in what he said. I was watching his face."

Preston snorted. "Do you mean to tell me that you sat there and swallowed that dope about solid electricity and the NN-4 wave, the *Patrician,* and the paradox?"

"I do, whether you think I'm crazy or not." Preston turned to me. "What do you think about it, Cloukey?"

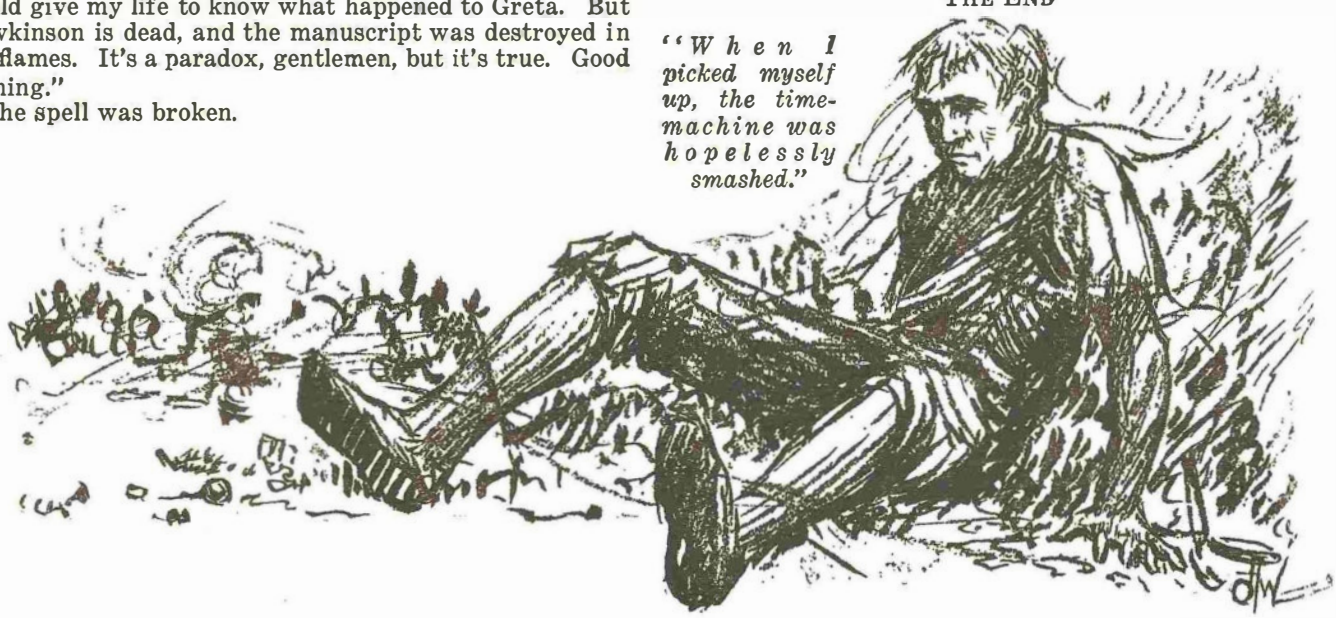
"I think," said I, "that arriving four feet up in the air wasn't the only trifling inaccuracy that machine made. Didn't it occur to any of you gentlemen that Cannes had his dates mixed? Today isn't the eighth, but Sunday the seventh of October." I glanced at the clock. "It's so close to midnight that it doesn't make much difference."

"By Jove, you're right," ejaculated Preston. "I'll have to tell him about it."

Cannes had left the club a minute previously. The entire group who had listened to his story followed Preston as he went to the door. Stepping outside, we noticed Cannes buying a newspaper at the drug store across the street. Involuntarily I looked up at City Hall Tower. It was still the seventh of October, five minutes to twelve, and suddenly I had a premonition of disaster. Preston called across to him. Raymond Cannes turned, looked at us a minute, and started across the street to us.

A deathly white came to Sherman's face as a speedy light delivery truck careened around the corner at thirty miles an hour. Cannes never knew what hit him.

THE END



"When I picked myself up, the time-machine was hopelessly smashed."

Doctor O'

By T. Proctor Hall

Foreword

RADIO waves reach around the world. Is it possible that they may be used to see into the ground? They are used to transmit across the Atlantic a picture of events taking place here. Can they be used also to find a lost person, to search out a known criminal, or to find the centers of criminality?

X-rays are destructive to certain parts of the human body. Are there other ether waves that will stimulate the growth of muscles or glands or brain?

Sunlight is ether waves. It cures many diseases. Might other ether waves be found to combat an epidemic, or to accomplish what is now sought by multitudinous serum injections?

These are the lines of thought followed out by Doctor and Mrs. O'Glee and their associates. In the coming decade in which the scene of the story is laid, such thoughts may seem much more natural and normal than they do to some of us now. The Psychologic Age is approaching rapidly.

CHAPTER I

Introducing Brown

ON a frosty morning in the spring of the year 1937 a young man stepped from the day coach of the D. & R. G. train at Leadville, Colo., and looked about him. It was evidently his first visit to the far-famed mining town. After a few minutes he called a taxi. "Take me to the office of the manager of the Little Johnnie mine," he directed. He kept his suitcase in his hand as he entered the taxi.

William K. Brown, B.S., had spent the winter at the Institute of Technology, Worcester, Mass., investigating some new apparatus for the detection of minerals, and especially ores, by means of radio waves. His latest experiments had been so successful that he was anxious to try his system under ground in the actual workings of a mine; hence his trip to Leadville.

Arrived at the office he presented his card, together with a letter of introduction from the president of the Institute. The manager received him cordially. Brown began at once, "Mr. Campion, during the last year I have been trying, by means of short radio waves, to detect the presence of various metals. I am now able to detect a piece of gold, for instance, fifty feet away, through walls of wood, brick, or stone, and even when buried in the ground. Now I want to try my detector in a mine. Here it is. It looks, and is, quite simple."

He opened the suitcase and exhibited what appeared to be an ordinary portable radio set, with batteries and earphones attached. Placing these on a table in the office

Glee's Experiments

WHAT causes criminals has long been a subject for much discussion. To be a master criminal requires a great deal of clever planning and shrewdness. What makes people direct all their best energies into outlawed channels? Many authorities on the subject of crime say it is a disease of the mind and will eventually be subject to complete cure. Science will, undoubtedly, play a great part in effecting such results, just as it is contributing to overcome other malicious diseases until recently called incurable. Electricity is, relatively speaking, an unexploited science as yet, but what uses may it not be put to?

he adjusted the ear-phones to his head and remarked, "With your permission, I will see whether you have any specimens of gold in your desk or about the office." Picking up a small tube that formed part of the apparatus, he pointed it toward the desk, then at various parts of the office where specimens might be hidden. When his survey was completed he turned to the manager with a smile, "In the right hand lower drawer of your desk there is a piece of gold, and a larger amount of it in that closet, on a shelf about eighteen inches from the floor."

"Correct, Mr. Brown. If you can repeat that performance underground your fortune is made. My name, by the way, is Wilberforce, not Campion. I took a course in mining engineering at Worcester in 1933, and have been here two years. I am delighted to be able to give you some assistance in your experiments. Here are the plans of the different levels of the mine. I will call a guide; and if you wish to enter the lower levels the guide will provide you with waterproofs."

Brown expressed his thanks, replaced his detector in the suitcase, and accompanied the guide to the cage, which carried them into the bowels of the earth. Several hours later he reappeared, looking rather crestfallen.

"Well, my boy, what luck?" asked Wilberforce.

"None at all. The detector does not seem to work down there; or rather I should say it works too well. I get the reaction for gold from every possible direction. The whole place is saturated with the wave that is characteristic of gold."

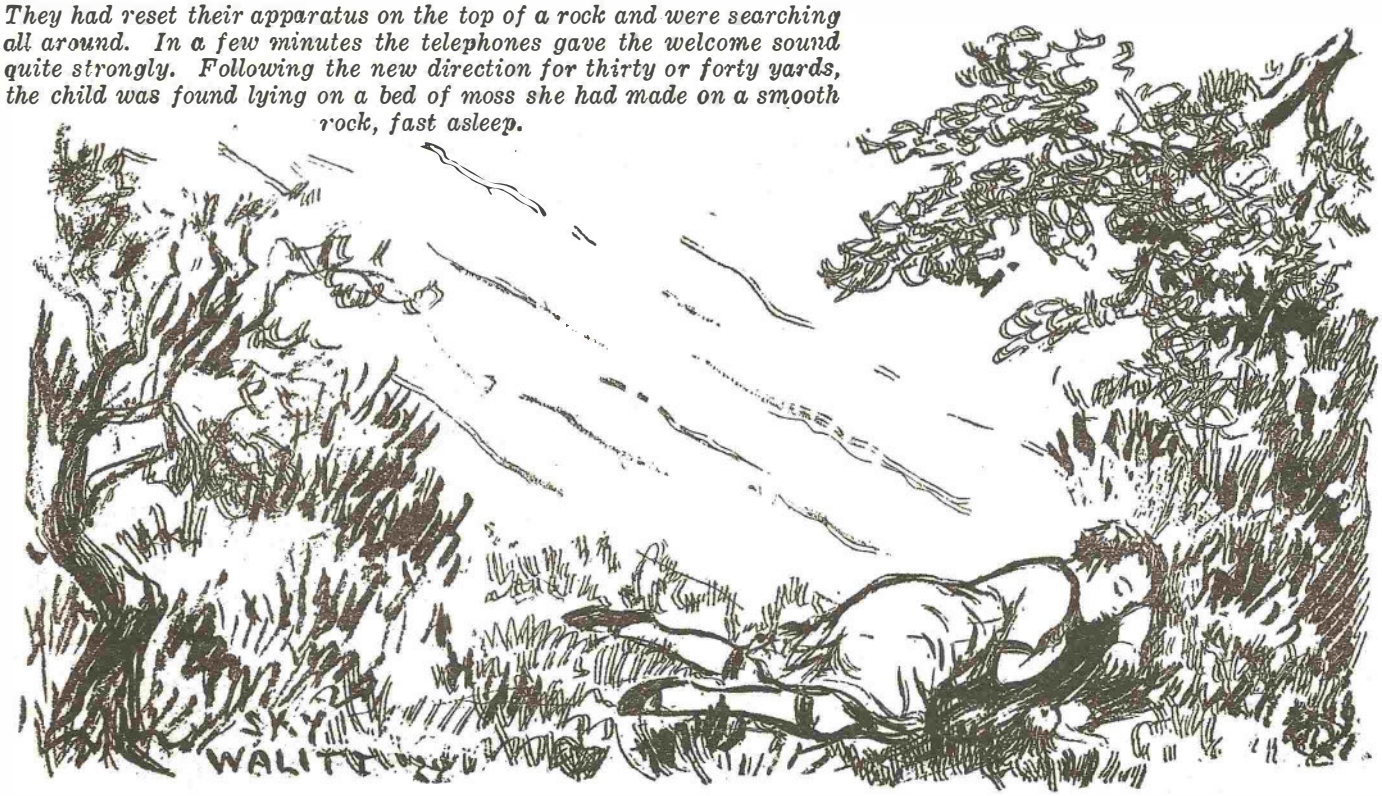
Wilberforce smiled. "Your detector is right," he said. "All the rocks down there contain gold, but it is only here and there that it is found in sufficient quantity to pay for extraction. In mining, we are obliged to feel our way by a continuous series of assays, aiming always at the richer parts of the vein. If you can arrange your detector so that it will tell you the richness of the ore five feet ahead of the excavation, it will be invaluable. You should be able to find a solution for the problem. All you need now is a system of measurement.

"In the meantime, while you are getting your ideas straightened out, how would you like to try some surface prospecting. You are on the ground and you have your detector, which is efficient on the surface; why not try your luck? Get a burro and camp supplies. These hills contain any amount of undiscovered gold, and any old prospector will be glad to take you into some of the most promising regions."

"That is a good suggestion, Mr. Wilberforce, and I believe I will carry it out. I am certainly obliged to you. When I get the detector into better shape, you will see me again. Good-by."

At the hotel that evening Brown met a number of prospectors of various types. Most of them related stories of rich deposits of gold or silver found by some former friend, who had unfortunately died without leaving any exact description of the location of the find. A few were apparently in the habit of wandering about, hoping for a chance find that would remove them permanently

They had reset their apparatus on the top of a rock and were searching all around. In a few minutes the telephones gave the welcome sound quite strongly. Following the new direction for thirty or forty yards, the child was found lying on a bed of moss she had made on a smooth rock, fast asleep.



from the hand-to-mouth existence they now endured. Most of them spent their energies exploring on the edge of known mining areas, reasoning that if the region contained known ore-veins it probably contained some unknown ores also. All agreed that luck was a big factor in success. One old man, who bore the euphonious title of Smithkins, probably on account of his small stature, and who had prospected in and about almost every mining region in Colorado during the last thirty years without any marked success, showed undiminished enthusiasm. "There are as big fish in the sea as ever were caught, and I'll make it yet. Just watch me!"

A few were completely discouraged and expressed the opinion that all the mines that were worth anything had been discovered from twenty to fifty years ago. "To find a mine now, you have to spend more time and money than the mine is worth when it is found. I'm going to give it up."

GRADUALLY Brown became aware that Smithkins was telling a story. "Well, as I was a-sayin', this old priest was wanderin' round on Pike's Peak, lookin' as if he didn't know just what he wanted, when I hailed him. 'Lookin' for some one, stranger?' says I. 'What few people there are 'round here are all saints. One or more of them goes to glory every week or so,' says I, 'so I don't suppose there'd be much demand for your services.' The old gentleman sort o' smiled and said, 'Stranger, I'm seventy years old. I was born in Rome, and until a year ago I had never set my foot twenty miles away from the spot where I was born. One night I dreamed that I had died, and was standing at the gate of Heaven. The Lord asked me what I had been doing on the earth, and I said, 'Lord, all my life long I have not ceased to point men to the glories of the world to come. 'That is good,' said the Lord. 'What do you think of the glories of the world I put you in?' I had to confess that I had seen very little of them. When I awoke and found that I had a little time left in this world, I made up my mind to spend a part of it in seeing some of its glories. So, you see boys, the old priest was just out lookin' at the scenery, and there sure is lots of it lyin' 'round loose in this country."

"Is the scenery about Pike's Peak any better than it is around here?" asked Brown.

"Not a bit better," replied Smithkins, "only bigger. But take a walk over to the top of Holy Cross Mountain and you will see as far as there is any use in seein', in several directions. Are you huntin' for big things, stranger? If you are, maybe you'd like it better down in Yosemite. They say a man can walk all day there and never be able to tell, from general appearances, that he has moved a step from the place where he started."

"No, thanks. I don't want a place as big as that. I'd like to get somewhere when I start. Do you know any place around here where there would be a reasonable chance of finding ore, if a man were able to see a little way into the ground?"

"Sure! Lots of them. A man that can see a foot into the ground, though, is a privileged character 'round here. Usually they preserve them in cities in big institutions."

Brown laughed. "But you must have heard of X-rays which the doctors employ to photograph the bones of a living man. Why should seeing into the ground be considered impossible? In fact, I know of an apparatus that has been invented for that very purpose."

LATER in the evening Smithkins inquired privately of Brown whether there was any truth in what he had said about an instrument for seeing into the ground. Brown told him of his success in the detection of metals through the air, and of the failure to succeed in the mine. He also expressed his intention of trying surface prospecting with the help of his detector as it was then.

Smithkins was intensely interested. "Just what we want!" he exclaimed enthusiastically. "Somethin' so's we can see under the ground." He proposed that he and Brown go into partnership immediately. "I'll show you the mineral fields; you find the veins; and we'll go halves."

Brown was almost equally delighted. The proposition suited him exactly. In the morning, with Smithkins' help, he selected a pony and some camp equipment. Before noon they took the trail in a northwesterly direction across the continental divide, continuing along the Eagle River to Two Elk Creek, which empties into the Eagle a miles east of Minturn. Turning north they went up Two Elk for a mile or so till they came to an old log cabin. The roof of the cabin had partly fallen in, but there was enough of it left to give good shelter in case of a storm. Here they camped for the night.

The horses were staked in a large grass-plot a little further down the valley. A thirty-foot rope gave each horse a plentiful supply of grass. "Don't ever stake out a horse from the plains with a long rope," said Smithkins. "I lost a horse that way once. He didn't understand it. When he reached the end of his rope in one direction, and found he couldn't go any further, he turned right round and started off at a gallop in the other direction. At the end of the rope he turned a somersault and broke his neck. No, sir; a horse is a mighty intelligent animal; but he is just like a man; you got to give him time to get used to new things. Why, a horse fresh from the plains would starve to death on these hills if a foot of snow came. But you put him along with some mountain ponies and it doesn't take him but a day or two to learn to dig into the snow and find the grass the way they do."

After supper they spread their blankets for the night, and Smithkins indulged in further reminiscences. "About thirty years ago a fellow from an eastern college came to Two Elk and built this cabin. He brought his wife and family along, and spent a winter here, diggin' a tunnel into the side of the hill a few hundred yards further up. There is some galena (lead sulfid) in a limestone outcrop up there, and he was aimin' to hit the limestone deeper down underground, thinkin' there might be more lead down there. The tunnel goes in about a hundred feet. The last fifteen feet is in a bed of slate. He never found the limestone, and of course he never got any ore. Your work to-morrow will be to find where that galena leads to. The only way to get anything in minin' is to follow your ore. But that college fellow was like all the rest of them, he had very little horse-sense. One morning he left his work and spent three hours climbin' that mountain to the east, just to see what was on the other side of it. When he saw more mountains, he came back. He did have sense enough to take up with him a pair of skis so that the return trip took only ten minutes." After some minutes' reflection, Smithkins continued, "What the dickens he expected to find in a bed of slate beats me. Well, it takes all kinds of fools to make a world."

In the morning Brown adjusted his detector for galena and examined the limestone ridge. Indications of lead were very clear at the surface, but none were found further down the hillside near the level of the tunnel. The tunnel itself was unsafe, as some of the timbers had given way, and a slide of loose rock was possible at any time. The remainder of the day was spent in exploring the valley both upward and downward for gold and silver, without success.

Next morning they left the cabin and took up their march westward toward Mt. Powell. Traveling was rather difficult, for their route was directed across the plateaus and across the deep valleys that the streams from the north had cut in them ages before. The sides of the valleys were often precipitous, with a sheer drop of from

fifty to two hundred feet. In such cases it was necessary to go down the plateau or up (and generally up), a mile or two to find a way for the horses. On one occasion they found it necessary to travel completely round the head of a deep gully; and since night was coming on they pitched their tent in the snow, near some scrubby trees that formed a shelter from the cold wind. During the night the temperature dropped twenty degrees. There was little food for the horses. When morning came, the prospectors decided that this was too wintry for them, and after a hasty cup of coffee, which was cold almost as soon as they took it off the fire, they turned southward to find a lower level. On their return journey Smithkins went within a few feet of the edge of the snowbank, where there was a "cornice." His horse broke through the snow crust, but fortunately recovered himself and walked on. Smithkins dismounted to see what had caused the trouble, and looked through the hole left by the horse's foot, down into the valley two hundred feet below. "Pretty close call, that," was his comment as he remounted.

A week was spent at this work without finding anything they thought worth further investigation. Surface indications of copper were not uncommon, but the detector failed to give any encouragement.

ONE afternoon they came to the precipitous edge of another valley. There was a drop of thirty feet, and after that a more gradual slope. It was likely, therefore, that a passage would be found without going a great distance in either direction. As they sat enjoying the scene before them, the mountain stream meandering among the trees, with patches of grass here and there, they noticed a cloud ten or twelve miles down stream. This rose rapidly and made its way toward them. Its manner of approach resembled an oncoming tide, the advance wave rolled onward one or two hundred yards, then receded slightly, in preparation for another advance. Behind it the valley was completely hidden. In half an hour the travelers were engulfed, and could not see twenty feet in front of them. Further search for a road down to the valley was out of the question for that day.

His complete failure to locate any mineral veins was a great disappointment to Brown. He did not know whether it was the fault of his detector, or whether Smithkins knew less than he thought he did about the mineral regions. Smithkins, on the other hand, was becoming certain that the detector was no good. Under the depression of this fog, his irritation came to the surface, and in the most vivid and expressive language of the hills, he told Brown what he thought of his invention, of him individually, of his college, and of college people in general, and of Brown's ancestors for several generations back. He ended by taking his horse and all his belongings and starting down toward Eagle River.

Brown listened in silence to this tirade. When Smithkins was out of sight, Brown remarked to himself, "Old man, you may be more than half right, but you needn't get so mad about it. Since you feel that way about it, I will keep my distance." He found a grassy plot to stake his horse, and rolled himself in his blankets on the lee side of a bushy stunted tree to enjoy the sensation of loneliness. Soon snow began to fall. Peal after peal of thunder was heard, much to Brown's astonishment, for he had always associated thunder only with rain.

After the thunderstorm, the air cleared a little, but Brown decided to stay where he was till morning, then find his way to the river and on to Minturn. Apparently his detector worked only on the surface of the ground. It would be worth trying in places; it might succeed!

At five the next afternoon he arrived at Minturn. "Hallo! Are you the chap that was out with Smithkins? He came through here yesterday just before dark, mad as a hatter, and we were afraid he had done you up. His reputation, you know, is not any too good. More than one prospector who went out with him was never seen in these parts again. Of course that may not be Smithkins' fault, but it looks mighty bad." The trader rambled on with his gossip for some time, and ended up by offering Brown one-third of its value for his horse and camp outfit. Brown accepted the offer for the horse, took the night train westward, and two days later at Seattle took passage aboard a steamer bound for Alaska. This time his equipment included a magazine rifle and an automatic.

CHAPTER II

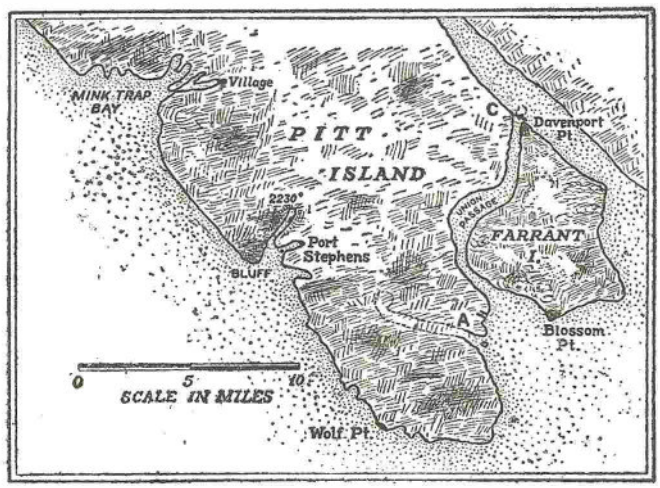
Pitt Island

WHEN Brown awoke in the morning, the steamer was some distance past Vancouver, ploughing its way north. Most of the passengers were tourists. Among the others it was easy to pick out prospectors and miners; among these he sought acquaintance. As usual, each was ready to spin his yarn, and Brown was glad to listen. He became interested in a one-armed man from Tacoma, named Walker, who told him he was on his way to Pitt Island, south of Prince Rupert, to prospect for a vein of gold-bearing quartz. As they sat by themselves in a cozy corner on deck, Walker told him the story.

"More than forty years ago two men were going to Prince Rupert in a sailboat. A storm came on, and they were obliged to take shelter in a narrow inlet in a large island they were skirting. They coasted the north shore of this inlet for a mile, found a well-sheltered spot, and spent the night there. The storm continued. After breakfast they decided to try for a deer. One of the men went northward along the coast. Before noon he returned empty-handed. The other climbed a low ridge that ran parallel to the inlet, and started toward the northwest among the low round-topped hills that seemed to occupy the whole interior of the island. About noon, while crossing a small dry ravine, he noticed a broken ridge of quartz, and on looking closer he found that it was studded with gold nuggets. Breaking out as many of these as he could, he filled his pockets with them, took a survey of the general appearance of the place, so that he would be sure to recognize it again, and started homeward. After walking two hours he found a deer, made his lunch, tied up a bunch of the meat for his comrade, and went on. In another hour he came to the shore. But the sun had come out for the first time that day, and he saw that it was the western shore of the island, whereas the inlet they had entered was on the eastern side. Evidently he had lost all knowledge of the compass directions. He turned about and walked in the other direction till dark, built a fire, and spent the night in the woods. In the morning he resumed his march toward the rising sun, and at noon found himself on the eastern shore, but a long way north of the inlet. He cached his rifle and the meat, and with the help of two friendly Indians who took him some distance in their canoe, he rejoined his companion before dark. His story was hard to credit, but he had the specimens in his pocket. In the morning they sailed up the coast to the point of his emergence, found his rifle and the meat, took supplies for the day, and started to retrace his steps to the find. But retracing the way was harder than they expected. The broken twigs they thought would be so easy to follow seemed now very far apart, and the trail took turns that were surprising, yet they were apparently necessary to get around obstacles. Twice they lost the trail entirely, and it was only by good luck that they found it again. When the shadows began to lengthen, they had to stop, and they spent another night in the woods. When morning came, the trail was clear as far as they had come, but they could not trace it further. They were obliged to return to their boat. Busi-

ness reasons compelled them to drop the search for that summer.

"Early next summer they were on hand with a full line of supplies to renew the search. They had procured a map of the island, which was easily recognizable from its location and size as Pitt Island, fifty miles long and ten to fifteen wide. They decided that in the wandering trip from the sheltering inlet, opposite Blossom Point, which I have marked A on the map, the prospector must have traveled at least fifteen miles, which would bring him to the west coast near the landlocked Mink Trap Bay. From this point an easterly trip of about the same distance would bring him to the coast at the point of emergence, marked C, a little north of Davenport Point.



"They first attempted to make the trip over again, beginning at A, in the inlet. The attempt proved futile. Next they sailed up the west coast to Mink Trap Bay and started in from that point. This also proved a failure. A second attempt to follow the trail from the point of exit at C was no more successful than the first. During the following winter both these men were lost in a storm at sea. I had met one of the men a few months before, and this is the story he told me.

"My own personal knowledge of the facts is confined to this: The prospector sold his specimens in Tacoma for three hundred dollars, and the description given of the character of the island is correct.

"The value of gold is about twenty dollars per ounce, Troy weight. This makes three hundred dollars the equivalent of one pound, Avoirdupois. A quartz ledge, from which a man could pick out that much gold with only pieces of rock for tools, must represent something worth looking for. So far as I know, I am the only man who knows the story of the discovery, and I am going to find out more about it if possible.

"In my opinion, these men overestimated the distances. They were not much good at making a straight line through the bush, and they thought they were going faster than they really were. To cover the distances they assumed, the speed of travel through the woods must have been between three and four miles an hour. If they made two miles per hour, they did well.

"Reviewing their story with this in mind, it is evident that Mink Trap Bay was too far away for them to touch. There is another harbor, near Bluff Point, which answers their description equally well, and which was within reach. From this point, if one followed the rising sun (which would lead one considerably to the north of east), he would reach the coast about the point marked C. I figure then that the search should be confined to the region south of a straight line from Bluff Point to the point marked C, and north of the inlet. One summer spent in exploration of that region should be sufficient.

"As to the probability of the whole thing being merely a prospector's yarn, there is the fact of the gold specimens, and the further fact that on one of the Queen Charlotte Islands, which lie west of Pitt Island, there is a similar dyke of quartz carrying small nuggets, and running east and west through a mountain. The vein is only an inch in width, and so is not the bonanza it would be if it were a foot wide. But if such a vein were to widen at one spot, we would have exactly the find that these men described."

In return Brown gave Walker a summary of his investigation on the detection of minerals, and gave a demonstration of his ability to detect gold through air and wood. He attributed his failure to find any veins while prospecting with Smithkins to the fact that the ore bodies, if they were present at all, were down deep in the rocks. He pointed out that if this quartz ledge were really studded with nuggets, he would be able to find it if he got within any reasonable distance.

AFTER a thorough discussion of the case, Walker offered Brown a quarter interest in their find, if he would join him in the search. This struck Brown as quite reasonable, and papers were drawn up and signed to that effect. They were to leave the steamer at Prince Rupert, get a launch or a sail-boat, and make their way to the inlet; then pursue whatever course seemed best.

No launch happened to be available at Prince Rupert, but they found a clean sail-boat, nearly new, for sale at reasonable rates. It was bought, stocked with provisions for a month and with all necessary material for opening up a vein, and with a fair wind they started south. Arriving at the inlet, they followed it westward for six or seven miles. Here it turned to the north and ended in a small bay. A six-foot waterfall on the north side of the bay, effectually prevented further progress with the sail-boat. Exploration showed that the stream above the fall was only a hundred yards long and was the outlet of a small lake, which appeared to be one of a chain of lakes in the interior of the island. It was decided to leave the sail-boat in as secluded a spot as could be found, and push ahead with their canoe with what supplies they could carry.

The first fall was easily overcome by a portage. The lake was only two hundred yards across. At the north end it narrowed to a winding stream which quickly opened out into a larger lake three-quarters of a mile in diameter. Falling into this from the north was a beautiful stream, which by common consent they called Rainbow Cataract. A short portage and a climb of twenty feet led them past Rainbow Cataract to a larger lake, a mile and a half long, which proved to be nearly the shape of the letter H. They were entering the south end of the eastern branch. About half way up the branch they made their camp on a projecting rock. They were glad to get into the tent, for rain was already falling quite steadily.

When they were settled, Brown asked to see the maps again. When these were unfolded he noted that, though the coastline of the island was marked with apparent exactness, little of the details of the interior, except some mountain peaks with their heights, was given. Only the mouth of the deep inlet they had entered was marked; and none of the lakes they had passed through were shown. The interior of the island was evidently still unsurveyed. Recalling the story of the two prospectors, Brown expressed his surprise that they could have crossed such a chain of lakes without seeing them. Walker was equally surprised, but could throw no light on it.

All the next day the rain continued steadily. Walker explained that this weather was to be expected. "We are close to the center of the area of heaviest rainfall on the west coast, averaging twelve feet per annum. Some fifteen years ago the twelve feet of water fell during the

first eleven months of the year, and in December came another twelve feet. You may have noticed on the way up that if we stepped off the rock we were on a porous soil composed of roots, moss, leaf mould and decaying logs. That is almost the only soil there is here, and it lets the water pass through freely. If it were otherwise, this whole place would be a rocky bog. We will take a rest to-day, but to-morrow we must don our oilskins and start out. It won't do to wait for fine weather here.

"I confess that the fact that those fellows said nothing about these lakes bothers me. They never saw them; that is certain. Now why didn't they see them? It looks as if the whole story was a hoax. But then the specimens were there, and they did spend a lot of time hunting for something on this island. We'll take a look around to-morrow."

In the morning they made an early start and went as directly east as was practicable to the coast. It was late afternoon when they got back. Walker carried a pedometer, which recorded the number of his steps, and by estimating the length of his average step he could get some idea of the distance. The instrument was set for a step of two feet, but on stepping off a measured distance through the bush, such as they had traveled through that day, Walker found that the average length of his step was less than eighteen inches. The distance to the coast was therefore only about a mile and a half. The three-mile trip had taken the greater part of the day.

This put an entirely new construction on their theory about the prospectors. It became clear that the western coast had not been reached at all on the original expedition. The edge of the larger lake was probably mistaken for the seashore. That also explained why no mention was made of the lakes in their story, and explains why their later expeditions, especially the one from the west, led to nothing. From the present data they concluded that the prospector started toward the northwest, and gradually turned toward the north and east, so that when he attempted to retrace his steps he went straight toward the large crooked lake, which he mistook for the western seashore. The actual location of the vein, on this theory, could not be far from the edge of this lake, or at least somewhere between the lake and the eastern shore.

AN exploration made to the upper end of that arm of the lake showed another small lake to the northeast. Climbing a 500-foot hill they saw two more lakes, which continued the chain in the same direction. Referring again to their map, on their return, it was evident that the prospector in going to the eastern shore had kept to the southeast far enough to miss the whole series of lakes, before he arrived at the point marked C.

A search of the whole region to the east of the lake was decided upon. The "round-topped hills" were conspicuous and numerous, and these were made the bases of the plan. Climbing to the top of the first, Brown's detector was set up, and the valley all round was searched as fully as possible for evidence of gold. On the third day they found it. The telephones hummed distinctly when the finder was directed toward a ravine. Walking down the ravine a hundred feet they found the quartz ridge standing distinctly across it, covered with moss, and practically indistinguishable from a decaying log. A few nuggets were found, but none that they could extract without a pick. They followed the outcrop of the vein to within a half mile of Crooked Lake, put up two location notices, and returned to camp. Next morning they started for their sailboat in the inlet to get mining supplies. Everything was as they had left it, and they returned the same day. Next day saw them started at the ten-foot hole required by the mining law. A week later the second "assessment" was completed, and they began to have some definite idea of the value of their discovery. The vein was at its widest where they had first discovered it. Its width was maintained but not increased at the depth of ten feet. To the east and to the west the width diminished, as far as the vein was traced, disappearing at a width about two inches. At a rough estimate the quartz carried two to three thousand dollars of gold per ton, for a known distance of 475 feet, with an average vein width of three inches. The amount of ore "in sight," assuming a depth of ten feet everywhere, was a little less than 100 tons, having a minimum estimated value of $200,000. A purchaser is expected to pay the value of the ore in sight, relying for his profit and for the cost of operation on the ore not yet visible. At this rate Brown's share of the claims was worth $50,000. Walker offered him $5,000 in cash, $5,000 in one year, and a ten per cent interest in the mine. Brown decided to accept the offer. They sailed back to Prince Rupert, recorded the claims and completed the transfer.

CHAPTER III

Introducing Norine

"I MET such a pleasant lady at the Badminton Club Tuesday evening, and I have invited her and her husband to join us at bridge to-night," said Mrs. Wardel to her husband at the tea table. "They are Dr. and Mrs. O'Glee. They have their home very near us, on Bloor Street near Spadina. I expect them at eight."

"I suppose the children can retire early," Mr. Wardel remarked, turning to them. "What do you say, Kiddies?"

"Not I," said Anna quickly. "I'm going to stay up to see the company. What's the use of having people come here to get acquainted, if we can't see them? Tell me that, Daddy." Anna was eight years old, and considered herself a full-fledged member of the family. Her brother Bob was six, and was ready to second Anna on all occasions. "Me, too," he said, looking up into his father's face. "And what about you, Norine?" said her father turning to the eldest. "Yes, Father, I will see them," Norine said, gazing for the moment out of the window.

"The opinion seems to be unanimous," Mr. Wardel said, smiling at his wife. A look of pain was in her face as she turned from Norine to her husband. But she said brightly, "All right, Dears. You may run off now and see that you are all ready at eight to receive the company." To her husband as they scampered off she said, "Is there no hope?"

"I am afraid not," was the reply. "I saw Dr. Johnson to-day, and he says there is no help for it. He had some hope from the thyroid extract. When that failed, he thought it possible that X-ray destruction of the thymus gland might be beneficial. Since that was effected and gave no result he says there is nothing more to be done." Her tears began to flow silently. Mr. Wardel kissed her and murmured, "Let us be thankful that the other two are so bright, and——we won't give up hope."

Promptly at eight the children were prepared to receive visitors. Anna saw that Norine's pleasant face was properly set off with a diamond brooch, a birthday gift from an aunt, while she herself wore a sleeveless and almost skirtless pink dress. Bob disdained everything fanciful and "silly," but delighted in a cut-away coat.

A few minutes after eight Dr. and Mrs. O'Glee arrived. They soon felt at home, and spent a very pleasant evening. After the children had retired, conversation lagged for a few minutes, then Dr. O'Glee said, "Mr. Wardel, I cannot help being very much interested in Norine. After graduating in medicine at Edinburgh I spent two years in the study of nervous and mental conditions in Paris. Most of this time my wife, who was a graduate nurse, studied with me. Norine is physically well developed. Would you mind outlining to me the steps that have been taken to improve her mentality?"

"Norine was two years old," said Mr. Wardel, "before she began to talk. By the time she was three we saw that there was some defect in her mental power. Dr. Johnson recommended thyroid extract in small doses. This was given for three years without apparent results. Physically she has always been well. A year ago the thymus gland was destroyed, and for a time we thought there was some improvement, but it was not permanent. Since then nothing medical has been done. We have tried on all occasions to treat her as nearly like the rest as possible, and I must say that my wife has played her part like a heroine. But now we do not see any light ahead."

"Mr. Wardel," said the doctor, "you have done all that you should do. The medical treatment has been the best available up to date, and your care of her in the home has been evidently perfect. It is among the possibilities that some of the later methods of treatment might give good results."

"Oh, Doctor, do you think there is any hope?" exclaimed Mrs. Wardel. "We would do anything to have her well."

"In my opinion," said the doctor, "the cure of such a case is possible. Norine's good physical health is strongly in her favor, but a cure is by no means certain. There are too many unknown factors present to let us make any positive statements about cure. But I think the experiment is well worth trying. I cannot even be sure that if the experiment fails no harm will be done, but I do not think the treatment would be in any way injurious, and I would be very hopeful of success. What do you think of the case, my dear?"

"I think the prospects of a cure are good," Mrs. O'Glee said. "I would be glad to take Norine home and do our best for her, if Mrs. Wardel is willing. She is a dear little girl and I feel so sorry for her."

"Mrs. O'Glee, I would do *anything* to get Norine cured."

"Mr. Wardel," said the doctor, "what do you think about it? Do you care to take that much risk? I think the risk is small—and the possibility of a gain big."

"How long would the treatment take?"

"That I cannot tell. Three months would be a very short time. A year might not be time enough. We could only judge by results. Think it over, and let me know to-morrow."

Dr. O'Glee was not engaged in the practice of medicine. Having an assured personal income, he preferred to carry on some experiments of his own, with the assistance of his wife, and had not taken the trouble to register as a physician with the Ontario Medical Council. Officially he was only a private citizen.

WHEN Mr. Wardel telephoned him that they were ready to place Norine in his care, he began to realize that it was no small undertaking. The more he thought of it, the more complicated it seemed. Toronto, he decided, was not a good place for the experiment. It must be tried in some place close to the heart of nature. For some time he and his wife had planned to visit the Pacific coast. Why not now? He called to his wife, "Ada, dear, will you go with me to the wilds of British Columbia and stay there a year, if necessary, to see this experiment through?"

Mrs. O'Glee was young and romantic. She was delighted with the proposition. The doctor said he would see whether the house could be let, and if so they would start as soon as they could get everything together. Mr. Wardel telephoned again that they were going to Muskoka in a day or two for the summer, and that he would bring Norine over that evening. When he came he remained only a few minutes, and the next day the Wardel family started for Muskoka.

Three days later the doctor and his wife started with Norine for British Columbia via the C. P. R. After an uneventful, but very enjoyable trip, they arrived at Vancouver and were established in the Hotel Georgia. A week was spent in looking about. Then they leased a cottage on the highest point of Glen Eagles, overlooking Howe Sound, in the western suburbs of the city. The doctor also leased an attic room in a house on Fifth Avenue in the Point Grey Region, near the University. From this room there was an unobstructed view across the water to Glen Eagles. In this room he placed an electrical apparatus that bore some resemblance to a searchlight, pointed it at the Glen Eagles cottage, and fastened it in place. The window was taken out and its place supplied by a single sheet of Vioray glass, a glass that allows waves both longer and shorter than waves of light to pass through. A junior university student in science who boarded at that house was engaged to keep the machine in order and turn the electric current on at 8 p. m. and off at 8 a. m. Extra tubes were there to replace any that gave out. The machine required no other attention.

During the railway journey to Vancouver, Norine had been under constant and careful observation. While in the Hotel Georgia, more exact and more technical examinations were made and recorded. She had just completed her eleventh year. Physiologically she was a year and a half older. Several tests of the Binet-Simon type placed her mental age at five years. The Intelligence Quotient, which is 100 times the quotient found by dividing the mental age by the chronological age, was therefore,

$$\text{I. Q.} = \frac{5}{11} \times 100 = 46,$$

according to which she was classed as a moron, or a subject below the average grade. In appearance she was rather pleasing, usually happy, thoughtless, and unable to fix her attention more than a minute on any one thing. None of the endocrines were found to have any marked deficiency, nor was there any evidence of hyper-function, except the ovarian. The heart, lungs, liver, kidneys, and digestive tract were apparently perfect. The estimated brain capacity was thirty per cent below the normal.

The senses of touch, taste, smell, and hearing were normal. The eyes required correction for a rather large error of refraction, which had been overlooked by the school physicians, because of her ability to strain the muscles of accommodation for a moment and read the finest print. Bi-convex glasses of 1¾ dioptrics gave her normal vision. When these were supplied, she immediately began to take more interest in things about her.

Norine's blood pressure was normal, systolic 120, diastolic 80. The color index was good, 95%. A blood count showed 4,580,000 red corpuscles and 5,200 white in each cubic millimeter. The differential count gave

Blood Platelets	11,000
Hemokonia	27,000
Leukocytes—	
Polymorphonuclear neutrophiles	65%
Eosinophiles	4%
Basophiles	0.2%
Small Lymphocytes	24%
Large Lymphocytes	7%

which is quite normal.

In the examination of the eyes it was observed that in the upper quarter of each iris was a white film, and near the border of each iris, further down, were snowflake patches. The latter, the doctor said, indicated inflamed lymph glands; the former, hereditary disease. The pupillary reaction to light was prompt; but, the doctor explained, it was only in advanced cases of disease that this reaction was delayed or absent. The Wasserman test was negative, but in the doctor's opinion the indication of this test is so often wrong that it does not amount to much.

Norine's hair was shingled, and she was given a night-cap containing woven wire threads which were connected by an insulated wire to the switch on the wall.

Electrical examination showed the existence of two sets of waves, whose lengths were 5 and 8 millimeters, respectively, which issued most strongly from the brain. These, the doctor said, merely confirmed the evidence already obtained regarding hereditary disease, and added the information that there was some tendency toward sarcoma. A test of the behavior of the blood in a one percent salt-solution gave further evidence of a malignant tendency.

A couple of days was spent by the doctor in overseeing the preparation of the Glen Eagles cottage. The south room up stairs was selected for Norine's bedroom. On the wall of the cottage, outside, he erected an insulated woven-wire receiver, which was attached by several insulated wires to a switch on the wall in the bedroom. The springs of the bed were connected by wire to a waterpipe. The bedstead was of wood.

After a week in the hotel they moved into the cottage. Norine's hair was shingled, and she was given a night-cap containing woven wire threads. These threads were connected by an insulated wire to the switch on the wall. On the second morning Norine complained of a headache. Dr. O'Glee found that there was a slight elevation of the temperature—half a degree—and concluded that the electrical treatment was excessive. By means of the wall-switch he reduced the effective surface of the receiver by one-half. There was no more headache, and during the next few days the effective area of the receiving wire was gradually increased to about two-thirds of the original.

Mrs. O'Glee arranged for Norine a set of industrial lessons in weaving, modeling, drawing, basketry, knitting, sewing, etc., alternating with games of various kinds, walks through the woods, gardening, fishing for salmon in the Sound, and she played with other children in the vicinity. No attempt was made to impose any tasks. Her physical health and constant good-nature made this part of the work a pleasure. Norine fell naturally into her place as an adopted daughter, sharing in the duties and pleasures of the day.

CHAPTER IV

The Doctor Selects a Nurse

IN the evenig paper was an announcement of a lecture to be delivered before the Chamber of Mines in their rooms the next evening on "The Detection of Mineral Ores by Radio Waves," by William K. Brown, B.S. Dr. O'Glee was not particularly interested in ores, but he was very much interested in radio waves. He attended the lecture. Mr. Brown outlined the theory of ether waves and exhibited a large drawing of the spectrum of all the known ether waves, from those a thousand meters long to the cosmic waves whose length is less than the diameter of an atom. The spectrum contained about sixty octaves. Near the middle was a single octave representing the spectrum of light, which single octave contains the only set of ether waves visible to us. For our knowledge of all the others we are compelled to depend upon mechanical or electrical devices—artificial eyes he called them. He described the construction of his detector, and described also a plan he was now carrying out for a companion instrument which would be a bright "wave-light," giving off abundantly the waves used in detecting the ores, waves which would be reflected from the ores *in situ* in the rocks. The companion instrument would correspond to a searchlight, and the detector to an eye. Using waves that pass freely through ordinary rocks, the only things "visible" to this apparatus would be the metallic ores.

The lecture started a lively discussion, in which all sorts of views were aired by those who looked on the lecturer's ideas as mere flights of fancy as well as by those who regarded them as entirely practicable.

After the lecture Dr. O'Glee introduced himself to Brown and made an appointment to meet him at lunch at the Dunsmuir next day.

The favorable opinion the doctor had formed of Brown was confirmed at this meeting. Brown entertained him with an account of his Colorado experiences, and his more successful work on Pitt Island. In return the doctor gave Brown a brief account of the experiment he and his wife were making in the development of Norine's brain.

"Your attempt is very interesting," said Brown, "but I am afraid I am not sufficiently familiar with physiology and psychology to understand how you expect to get your results. Would you mind giving me a fuller explanation?"

"Certainly," said the doctor. "It is not often I meet with anyone who is interested in this line of investigation, and especially with one who is working along similar lines.

"In the first place, such a condition as Norine's may result either from accident or from disease. As far as Norine herself is concerned, disease is a form of accident; but for practical purposes the distinction is worth making. Among the possible accidents may be mentioned external violence, which usually leaves its marks; breaking of a blood-vessel which interferes with the circulation of blood to the brain; and poisoning before or soon after birth. Among diseases, tuberculosis and syphilis are chiefly to be considered. The marks of tubercular disease are easily recognized. You may have seen a child with an extremely bulging forehead, caused by tubercular disease of the brain-membranes before birth. Syphilis is not so easy to recognize, but it is believed by many physicians to be our only hereditary disease. Any acute disease, such as typhoid, or erysipelas, or even auto-intoxication, in the mother might, either by direct action of their poisons on the nervous system, or by injury to some of the endocrine glands, interfere with normal brain development.

"NORINE'S condition appears to me to be due entirely to heredity. I have a delicate receiver by which I can test the functional activity of the various parts of the brain, and I find that none of her brain centers are destroyed. We have therefore to deal with a case of defective development only. It is possible that some individual brain cells may be dead; but it is more probable that many of them are embryonic, and that they may be revived and roused to full activity by appropriate stimulus.

"The cause of this defective development we do not understand, except that it is a result of the disease. A frequent condition is a thickening of some of the membranes of the brain, which may exert pressure on the arteries and thus reduce the supply of blood to the cells."

"That is quite clear," said Brown. "But supposing you do succeed in reviving these dormant cells, how are you going to make room for them in the skull? I don't imagine that there is any truth in the old jag about certain people having 'rooms to let,' is there?"

"The brain has no air-spaces, of course. There are certain 'ventricles' filled with fluid, connected with each other and with the cavity of the spinal cord, which allow a slight amount of expansion. In children there is no reason for any anxiety. As the brain develops, the skull enlarges to make room for it. Even in those tubercular cases to which I referred, the skull enlarges to make room for the useless fluid secreted by the inflamed membranes. Even in adults bone often gives way to a remarkable extent before a slight steady pressure. In an extreme case it might be necessary to

divide the skull along certain lines to give greater facilities for expansion.

"Having decided that Norine's mental state is due to this one cause, three things are to be done; namely, eradicate the disease, stimulate the development of the brain, and educate the growing cells. Eradification of the disease is accomplished by the properly selected electric wave. Brain development is stimulated by a similar wave. Education is best accomplished by nature through the fullest possible use of all the senses. The correction of errors of refraction of the eyes is very important. You can imagine what the world would be like to you if you only occasionally and with great effort saw things distinctly. That is what it has been like to Norine."

"How long do you think the treatment will take?"

"I do not know. Three months will probably be time enough in which to get rid of the disease. I have some hope that an additional three may start the development well on its way toward normalcy. We must judge by results. In a few days I shall be glad to let you see my apparatus and have you meet Norine, so that you may judge for yourself what progress she is making."

"I shall be delighted. And if there is anything in my line that you think may be of use to you, command me."

"Mr. Brown, since I heard your lecture I have been wondering in what part of the expanded spectrum you found your characteristic metallic waves. I do not recall your mentioning it.

"They are in the ultra-violet and just beyond."

"Have you examined the infra-red region? I suspect that you might find there some waves better suited for your purpose."

"I examined two octaves of the infra-red, but found nothing there as distinctive or as easy to detect as the waves in the ultra-violet. My apparatus was not suitable for exploration further down the scale."

"You may find an instrument patterned after mine more useful there. I find no difficulty in detecting waves whose length is anywhere from half a millimeter up to ten centimeters."

A few days later Dr. O'Glee telephoned Brown, inviting him to his home for the afternoon. On his arrival he was presented to Mrs. O'Glee and Norine. In the course of conversation with the former, he expressed surprise that she was taking charge of Norine without an assistant. "It must be quite a nerve strain," he said.

"Not such a strain as you might suppose," Mrs. O'Glee replied. "Norine is such an affectionate child that there is never any trouble in controlling her. But one of the reasons the doctor has for inviting you here to-day is to let you see his plan of selecting an assistant for me. He advertised for a young lady to assist in the care of a partially invalid girl. There are more than a dozen replies to the advertisement and he is going to look them over now."

Brown was astonished. Was this a joke? What possible sense was there in his watching the doctor look over these letters? But with as much politeness as he could master he replied, "No doubt it will be very interesting. I suppose the doctor takes them in alphabetical order, or possibly he begins with Z and goes backward. Does he use the microscope to detect slight variations from rectitude in the forms of the letters?"

Mrs. O'Glee laughed. "You will see. Here he comes."

The doctor entered at this moment carrying a large box, which he placed on the table. Opening it, he produced two pairs of ear-phones, one of which he gave to Brown, the other he used himself. A dial on the side of the box he set carefully. One of the letters was then opened and the missive placed in the box. A low humming tone was heard. When the missive was removed the noise ceased.

"My first requirement for an assistant is reliability, or conscientiousness. This applicant is not suitable."

One after another the fourteen letters in the pile were examined in the same way. Six were rejected. The dial was reset and the eight letters that had passed the first test were re-examined for happiness or brightness of disposition. Three were rejected on this test. The remaining five were compared for freedom from disease, with two rejections. The three remaining letters were opened and read. Two of the applicants had had some experience in nursing. The third had been a teacher. The doctor turned them over to Mrs. O'Glee with the suggestion that she call on each of them and make a selection. She went to the telephone to call a taxi, and Brown, who had watched and listened in silence to the whole procedure, settled back for the expected explanation.

"There is nothing new in this for you," the doctor exclaimed. "You pick out ores by their characteristic waves. I pick out people by their characteristic waves. What is there strange about it? Every piece of ore is for your receiver a miniature broadcasting machine; so is every human being a broadcasting machine for my receiver. You found that all the rocks in the Little Johnnie mine gave out gold waves. If you had tested the mine timbers you would have found it true of them too. Is the fact that the letter acts as a 'carrier' anything new? Why should not these letters, over which the applicants have probably spent time and thought as they wrote, why should not these letters bear the imprint of the personality of their authors?

"You have probably seen a 'psychid' who was able from a finger ring or an article of apparel to give a good description of the wearer. It is true that such people often make mistakes. It is also true that they are often quite accurate in their description, beyond the possibilities of coincidence, proving that there is some real connection with the individual through that article. This connection is now becoming a part of scientific knowledge."

"By Jove! I never thought of it that way before. I knew that a bloodhound could track a man through the woods, but it did not occur to me that a scientific hound could identify a man through his letters or clothing."

The discussion continued till late in the afternoon. Both men were so interested in their talk that they were totally unaware that Norine had wandered off and was now climbing the mountain a half-mile away. As tea time approached the doctor remarked that the air of this region was a great stimulus to appetite, and looked about to see if there were any preparations under way for the evening meal. Then he recalled that Mrs. O'Glee had left Norine in his charge. A hasty search showed that she had disappeared. At once a thorough search was organized. Brown took the road northward to Horseshoe Bay; the doctor went southward to Eagle Harbor. Enquiries were made of everyone they met, but no one had seen the child.

AN hour later they both had returned. For a few minutes neither of them spoke. Then Brown suggested that she might have gone into the forest. "If she has," said the doctor, "the chance of finding her is small. There are so many hiding places among the trees and rocks that it would take an army to find her before she dies of exposure. It is like looking for a needle in a haystack."

"Or like looking for a piece of ore in a cornfield," added Brown, as he jumped from his seat. "You have your receiver, Doctor, and you know what her brain-

waves are. Set your dial for the most prominent of them and we'll find her."

The doctor adjusted the dial, then he looked up hopelessly. "There is no use looking among people. There may be twenty or there may be two hundred who have this same wave."

"Then we will search the forest first," said Brown.

At Brown's request, the doctor hunted up a sheet of copper and some copper wire. The sheet was set in a wooden frame and a wire soldered to it. The other end of the wire was attached to the receiver. Taking the apparatus out on the veranda Brown handled the copper sheet while the doctor listened with the earphones. The copper plate was held in such positions that it would receive to the largest possible extent any wave that might reach it. Holding it so as to face the surface of the ground, he turned it slowly from the south, eastward, and to the north. Once there was a faint sound in the telephones, but it proved to be a man walking along the railway track. Then the plate was directed toward the lower portions of the mountain. The doctor thought the telephone sounded, but the sound could not be repeated. The search continued higher up, but it was useless to aim very high, for the child would not be able to go so far.

Brown stopped. "What wave have you set the receiver for, Doctor?" he asked.

"For the wave that represents her brightness, her strongest wave."

"Suppose you try another. If she is in the forest her vivacity will be pretty well scattered by this time. In fact, she may be exhausted, or asleep. Can you find a wave that will be as strong as ever if she should be asleep?"

"She could be traced by fear, but not if she is asleep. I will try the eight-millimeter wave." He adjusted the dial and they began again. From near the base of the mountain there came a faint but constant indication in the telephones.

"Good," said Brown. "Now we want a direction-finder. What substances act as an insulator for that wave?"

"There is a large sheet of bakelite in the closet. That will do."

Brown cut a six-inch hole in the bakelite sheet. A foot from the hole he mounted a circular portion of the sheet of copper, which was attached as before to the receiver. The revised apparatus was then pointed to the base of the mountain, and the position found in which the indication was most distinct. The direction was carefully noted.

The apparatus was packed for the most convenient transportation. Though bulky, it was not heavy. Then they started for the mountain. In less than half an hour they had re-set their apparatus on the top of a rock and were searching all around. In a few minutes the telephones gave the welcome sound quite strongly. Following the new direction for thirty or forty yards, the child was found lying on a bed of moss she had made on a smooth rock, fast asleep.

"Ella said there were berries up here, and I wanted to get some. But it is so far, and I'm tired," Norine said as she opened her eyes.

They joyfully took her home and put her to bed. Twilight came on before they reached home. An hour later Mrs. O'Glee arrived with the new nurse, Agnes Gem. They were greatly interested in the fact that Norine had been lost and was found, but the method of finding her they scarcely noticed. Mrs. O'Glee could not deny herself the relief of a word of reproach: "That is just like a man. No matter how smart he is, he needs a woman to keep him in order." Every woman likes to feel that she is necessary for the well-being of those she loves.

A month passed by. The nurse proved to be all that could be desired and all that her name suggested. She was rather above the average height, well built, graceful, and keenly intelligent. Norine fell in love with her at once. Even Mr. Brown did not seem to be proof against her charm, for he found it necessary to put in a great deal of time in the study of the doctor's receiver, and in reconstructing his own to make it suitable for longer waves. And since one could not work all the time, he and Miss Gem were accustomed to take a boat and troll for salmon for recreation, or if the day was suitable take Norine for a sail northward toward Britannia Mine.

ONE afternoon when Dr. and Mrs. O'Glee were alone Mrs. O'Glee remarked to her husband that it was strange that they had not heard from Mr. or Mrs. Wardel. "I suppose you gave them our address?"

"Upon my word," said the doctor, "I did not. I forgot all about it. Mr. Wardel told me they were going to Muskoka the next day, but he forgot to tell me what part of Muskoka, so I don't know his address. I must write him to-day. If I send it to his city address, it should reach him."

The letter was written and posted.

"Now," said Mrs. O'Glee when the letter was disposed of, "what do you think we had better do about getting another nurse?"

"Miss Gem is perfectly satisfactory, is she not?"

"Perfectly."

"Then why are you proposing to make a change?"

"I am not proposing a change."

"Has Miss Gem said anything about leaving us?"

"Not a word. I don't think she has even thought of it."

"Then just what do you mean? I don't understand you."

"You have perhaps noticed that Mr. Brown is here a great deal?"

"Yes. He is constructing a new detector, modeled after mine."

"And you think that is what he comes for? Have you noticed that Miss Gem is quite an attractive young lady? And that Mr. Brown is a bright and energetic young man? This is a case where one and one make two, but it won't be two very long. And then you will need a new nurse."

"Dear me! Can it be possible? I must speak to them about it."

"What good will that do? Would you, under the same conditions five years ago, have paid the slightest attention to anyone who ventured to remonstrate with you? I suspect you would have invited him to seek a warmer climate. Wouldn't you, dear?"

"Very likely I would. But this is different. We are making an important experiment, and nothing, absolutely nothing, must be allowed to interfere with it. It won't hurt those young people to wait a few months, and then they may do what they please; but not now."

"All that is quite clear to you; but how are you going to get the young people to take the same view of it? Don't waste your breath. The simplest way is to prepare for the inevitable."

CHAPTER V

A Contest With Cupid

THE doctor was much perturbed. His experiment was making satisfactory progress. Why should Cupid interfere? Was that insignificant little god going to be master of the situation, or was he? He would see.

The next day when Brown came (he came now nearly every day) the doctor kept his eyes open. Yes, there

was no doubt about it, Mrs. O'Glee was right. Something would have to be done immediately.

The doctor went to Point Grey and set the dial of his electrical machine at a different number. On his return he connected the springs of Miss Gem's bed by a wire to the water-pipe, and connected by insulated wire a small metal plate lying on her bed with the wall switch in Norine's room. Attached to the metal plate was a strap long enough to reach round the waist. Norine's wire he disconnected at the switch.

In the evening, after Brown had gone, he asked Miss Gem whether she cared to try the radio connection for a night or two to see whether she could feel any effect. She was eager to do so. The doctor told her to fasten the plate over her stomach by means of the strap when she retired.

In the morning, in reply to enquiries whether she had noticed any unusual sensations she declared that she had felt nothing at all.

"I slept all night, as usual. But this morning after I awoke I felt as if I had been asleep for a week and was awake now for the first time."

"Such a sound sleep has done you good," said the doctor. "Try it again to-night."

During the second night the same thing happened. Sleep was unbroken, with an unusually wide-awake feeling in the morning. The doctor expressed himself as satisfied with the experiment.

When Brown arrived Miss Gem asked him about his progress with his new receiver, but seemed indifferent to the personal conversations that had come to displace those of scientific import. Brown was disappointed, but it was impossible for him to find anything on which to base a complaint. He suddenly announced that his receiver was completed and that he was going to Toronto to consult a friend at the School of Practical Science about some further improvements. After that he would return.

Cupid had lost—for the present.

CHAPTER VI

Why the Police Came Into the Story

THIS is a story of Dr. O'Glee's experiments, and the police have no place in it. They are not wanted. But since they have obtruded themselves, some explanation for their conduct becomes necessary.

When Mr. Wardel gave Norine into the care of Dr. and Mrs. O'Glee the latter were considering a trip to British Columbia, and Mr. Wardel had decided to start with his family the next day for a vacation in Muskoka. In the confusion Mr. Wardel forgot to inform the doctor that his Muskoka address would be at Hamill's Point, and the doctor forgot to mention his projected trip to British Columbia.

After a week Mr. Wardel began to wonder why there was no letter from either the doctor or Mrs. O'Glee, and she addressed a letter to Mrs. O'Glee. Dr. O'Glee had been in Toronto less than two years, and had formed no intimate friendships. It did not occur to him to leave his address with the Post Office. Indeed, he did not at that time know what it would be. Consequently, the letter addressed by Mrs. Wardel was returned, unclaimed. Another letter was tried, with the same result. Mr. Wardel returned to Toronto to investigate. He found strangers in the O'Glee home. They did not even know who Dr. O'Glee was. They had rented the house for a year from Mackenzie and Glynn, real estate agents. Mr. Wardel went to Mackenzie and Glynn. Yes, Dr. O'Glee had instructed them to let the house as he was leaving the city, but he had not said where he was going, and they had not heard from him, but they certainly would hear from him in a short time, and when they did they would be pleased to let Mr. Wardel have his address.

Mr. Wardel returned to Hamill's Point to report progress. They waited another week; still no word of Dr. O'Glee. With increasing anxiety they arranged to cut short their vacation and return to Toronto.

Mr. Wardel went first to the Registrar of the Medical Council. He was surprised to find that Dr. O'Glee was not registered as a physician, and that he was not legally entitled to practise medicine in the Province of Ontario. The Registrar, of course, knew nothing as to his whereabouts.

Mr. Wardel next consulted the Chief of Police. The chief pointed out that if O'Glee were still in the city they might be able to find him, but since he had presumably gone somewhere else, he advised patience until he communicated with Mackenzie and Glynn, which he undoubtedly would do as soon as he felt the need of more money.

But Mr. Wardel was losing patience. He consulted a lawyer named Thomson, selecting him because he had known him for some time, and knew his reputation as a man who led his clients out of legal difficulties rather than into them. In ten years of practice he had had only one case that came into court for trial. All the other cases had been settled to the satisfaction of all parties without going before the judge. Thomson's advice was practically the same as that given by the Chief of Police. He suggested, however, that if Wardel was sufficiently certain that O'Glee's intent was criminal, he might swear out a warrant against him charging him with abduction, and leave this in the hands of the chief. This would enable the police to act at once in case O'Glee returned to the city. The warrant was made out and signed.

Still Mr. Wardel felt that something more could be done. O'Glee was evidently an imposter, a smooth confidence man, who should be apprehended at the earliest possible moment. He consulted a detective agency. The detective informed him that men of that type generally have confederates, and that while he might have difficulty in locating O'Glee, his confederates probably belonged to the criminal class, and it would be easy to get some trace of them in the city. He would set men on their trail at once.

After three weeks of search by detectives, and, incidentally, nearly a thousand dollars expense, two men were arrested on a charge of conspiracy to abduct Norine, and were committed for trial. The men were scornful about the charge. "What 'ud I want with such a gal as that? What do yu take me for? Go off an' shake yerself."

Mr. Wardel can hardly be blamed for the course he took. He had completely forgotten that he had not given his address in Muskoka to the doctor. Fate further complicated matters by losing in the mails the letter from Glen Eagles that would have explained everything. The detective offered some hope, and he grasped at it eagerly. When the two men were arrested, he was disappointed to know that there was still no trace of O'Glee.

CHAPTER VII

Jackson, the Convict

WHEN the trial came on Brown was in the courtroom watching the proceedings with interest. One of the prisoners, Jackson, had an unusually intelligent appearance. The other, Currie, belonged apparently to a lower grade. Both men proved to the satisfaction of the judge that they were not in that part of the city at the time of the alleged abduction. The detective offered no evidence of their guilt beyond a mere surmise, and was sharply rebuked by the judge for bringing up a case that should have been thrown out at the preliminary hearing.

After the trial Brown invited Jackson to take lunch with him. They found a quiet corner in a cafeteria. Brown described some of the latest improvements in short-wave radio transmission. Then, in a more confidential tone, he said, "Have you heard of the new plan that is used by the detectives to find any one that they want? Let me tell you. You know that radio waves are made in a central station and broadcast everywhere. A good receiver picks up these waves and makes them audible. Now if you had a receiver delicate enough you would find that every man is a miniature broadcasting station in himself. He broadcasts his state of health, his moods, his capacity for work of various kinds, and his habitual thoughts and intentions. All these are also impressed on his clothes, on the place where he lives and everything else about him. A delicate receiver picks up these waves at a considerable distance; so that when a detective wants to get hold of you, if he has even a handkerchief or an old hat to start with, he can get from it the most prominent of your waves and can pick you out of a crowd even if he never saw you before."

"Ha, ha, ha! You can't string me."

"I am not trying to string you. Come to my lodgings to-morrow and I will prove to you that I am not talking nonsense. Here is my name and address. Shall I see you at ten?"

"What's your game?"

"I'll tell you to-morrow. Will you come?"

"All right. I'll take a chance."

Promptly at ten Jackson was on hand. Brown gave him a half-dollar, and asked him to hide it somewhere in the room while he stood in a corner with his back turned. Then he adjusted his receiver and searched the room carefully. For some time he looked puzzled. Then he took off his ear-phones and said with a smile, "The money is in your pocket."

"Now," Brown continued, "that proves that a half-dollar gives off waves by which it may be found; and you know that a bloodhound can track a man. Do you need any more evidence?"

Jackson said he was willing to consider the case as proved—for the sake of argument—and expressed his willingness to listen to any further proposition.

"I want you to go to British Columbia, to a doctor there who is able to fix you up so that no detective could find you. He will alter the waves you are constantly giving off, so that from a wave standpoint you will be unrecognizable. The treatment is electrical, harmless and painless. I have not said anything to the doctor about this, but I am sure his charge will be reasonable. What do you think of it?"

"And if I go, what is there in it for you?"

"Nothing but the satisfaction of seeing it done. It made me tired to see the way you two were treated by the detectives, with not the shadow of evidence against you. I am going to Vancouver next week. You will find me at the Dunsmuir."

"You seem to be on the square. Maybe I'll come. So long."

The dailies, in commenting on the trial, reviewed the facts regarding Mr. Wardel's unavailing attempts to find his daughter, and mentioned that a warrant was out for O'Glee's arrest, and that his name was not on the list of licensed physicians.

On his return to Vancouver Brown's first care was to call at the Glen Eagles cottage. He had reflected that his hasty trip was perhaps scarcely justified. Miss Gem had treated him very coolly, it was true, but there might be some explanation for that. It might be a temporary indisposition on her part, or possibly it was largely his own imagination. At any rate it was only fair that he should see her again. He was delighted to receive from her a cordial welcome. Mrs. O'Glee and the doctor were equally glad to see him. Norine had made very marked progress during the three weeks of his absence. Her last test, the doctor said, gave her an I. Q. of 88. The doctor said he thought of returning to Toronto in another month.

"Did you know, Doctor, that there is a warrant in the hands of the Toronto police for your arrest?"

"A warrant?"

"Yes. On a charge of abduction. And I would not be surprised if there was also a charge against you for practising medicine without a license."

"But there wasn't any abduction, and I haven't been practising medicine, either with or without a license."

"You told Mr. Wardel, I think, that you would give Norine a course of treatment. That makes you guilty of practising medicine; and you are not licensed in Ontario. You also brought Norine out here without asking her father's permission, and, it seems, without letting him know where you were taking her. He has had detectives looking for you for more than a month. You don't know what a beautiful reputation you have cooked up for yourself in Toronto as a scoundrel of the first grade."

"That is a shame," said Mrs. O'Glee. "The doctor wrote Mr. Wardel explaining everything, and apologizing for his apparent neglect. What more does he want?"

"So far as I could learn, Mr. Wardel never heard from the doctor after he left Norine with you. If he didn't, you could hardly blame him for being considerably upset. He has not the faintest idea that it was partly his own fault. His temper now reminds me of old man Smithkins, the last time I saw him."

Brown then gave them an account of the trial he had attended, and of the proposition he had made to Jackson.

"I DID not tell Jackson everything I had in mind in making that proposition. If his waves are altered so that they are unrecognizable, will he be the same man he was before? Of course his identity will remain the same, but will he have the same attitude toward society? He has a good appearance. Don't you think that some accident of birth or heredity has given his brain a twist and led him to prefer a life of crime? With your apparatus for the control of the brain is there not a good prospect of straightening out such kinks as there may be in him, and of restoring him to a normal life? In his present state of mind he would object strongly to such a procedure, but after it was done he would be eternally grateful."

"Such a thing is possible," said the doctor. "The difficulty in most cases would be to get the patient to consent to the treatment. Your plan is ingenious. Why don't you build an institution for treating cases of that kind? The Government ought to pay all expenses. Think what it would mean to the Government if half the crooks in the country were cured."

"But tell me what success you have had with your mineral detector. Is the new form of wave-reception any improvement?"

"Yes. It is much better. The longer waves penetrate further into the rocks; and I have found one vein that I think is going to be worth something.

"On my way to Toronto, as we were passing along the shore of Lake Huron, I fell into conversation with an old prospector, who told me a lot of stories of the earlier days. Among other things he told me the romance of Silver Islet, near Port Arthur, and of the discovery of the Cobalt veins. Further east he told me of an expedition he had made into the region of the Muskoka Lakes, and mentioned that he had seen there a vein of crystalline limestone containing metallic lead. Of course I was curious, for I knew that lead is not found as a metal in veins. Native lead is a rarity. The compound of lead with sulfur, galena, is a form that is sometimes mistaken

for silver, but it is brittle and could not be mistaken for metallic lead. On the other hand, there is a compound of silver with sulfur which looks a great deal like lead. So I asked the old man how he knew it was lead he had found. 'Why, of course, it was lead,' he said. 'I hammered some of it up to make sinkers for my fish-line. It was as heavy and as soft as a lead bullet.' I expressed a great curiosity to see such a vein. He told me that there was not enough lead in the vein to pay for extraction, but that if I wanted very much to see it I might take the highway to the east from Parry Sound for about thirty miles. I would then come to a small lake, and on the south shore of this lake was the vein of native lead.

"With this information I made a pretty straight course for Parry Sound, hired a horse, purchased blankets, dynamite and drills, and provisions for a week, and started eastward. I fully believed the old man's story, for he told of his discovery as an incident of some interest, but as of no real value. When I had traveled the thirty miles, according to my reckoning, there were several small lakes in view. It was impossible to tell which was the right one. The only thing to do was to search the south shore of each one. I set up my apparatus and began. There was no silver on the shore of the first lake; nor on the second. But my detector sounded distinctly on the shore of the third, and before long I had found it. It was visible for only twenty yards. I staked my claim and went to work at once to do the assessment on it. The vein is small, and there has been no other vein of native silver found within many miles of this. I intend to make a thorough survey all around it, as soon as I get back.

"Now if you will allow me to make a suggestion, Doctor, I think it will be your best plan to wait quietly here until Norine is fully restored and then send her home with Miss Gem, or any one else you can trust. When Mr. Wardel sees his daughter restored, doubly restored to him, he will change his tune, and it will be safe for you to return. Until then you will be wise not to go near Toronto."

Jackson did not appear in Vancouver.

Brown remained for two weeks. Norine was now almost as dependable as any one, consequently Miss Gem had more time to devote to their visitor; and both Mrs. O'Glee and the doctor gave them every opportunity to improve their mutual acquaintance. Before Brown left for Toronto their engagement was announced.

In two more weeks Norine's I. Q. was 112, and Miss Gem was engaged to take her home. The sending was carried out with due precautions. They were driven by auto over some of the most mountainous roads, and then along the Pacific Highway to a small station on the Canadian National, on which they went to Toronto. Arriving in Toronto Miss Gem took a taxi to Norine's home, bade her good-by, waited till she was in her mother's arms, and immediately drove off to a hotel in the west end of the city.

CHAPTER VIII

The Epidemic of Influenza

A LETTER from Toronto!

Toronto, Canada, September 3, 1937.

Dear Friends:

Miss Gem and Norine arrived safely. You can imagine the delight of her parents on her return, and their regret that there had been that unfortunate misunderstanding at the first. In their opinion you have ceased to be "hounds of hell" and are now two bright and shining angels. Miss Gem (who is an angel, anyway) and I have been to see them. They surely are a happy family.

We are sending you an invitation to our wedding, which is to be on the twenty-first. We are going to spend the winter near Parry Sound. I have secured a house a mile from the town and overlooking it. The house is too large for us, and it will easily make two suites, so Agnes and I want you two to come and live there with us for the winter. It will be an agreeable tonic after the balmy air of the Pacific.

A letter from Jackson was forwarded to me from Vancouver. He has probably had more trouble with the police, and he is now anxious to take the treatment I told him of—"on any reasonable terms."

If you wire your acceptance of our offer I will get all necessary electrical appliances put into the house, so that you can carry on the treatment there through the winter.

You may come straight to Parry Sound. I am going to spend the winter prospecting in that region, and I have already an offer for the vein I found.

Sincerely yours,

WILLIAM K. BROWN.

The reply was prompt:

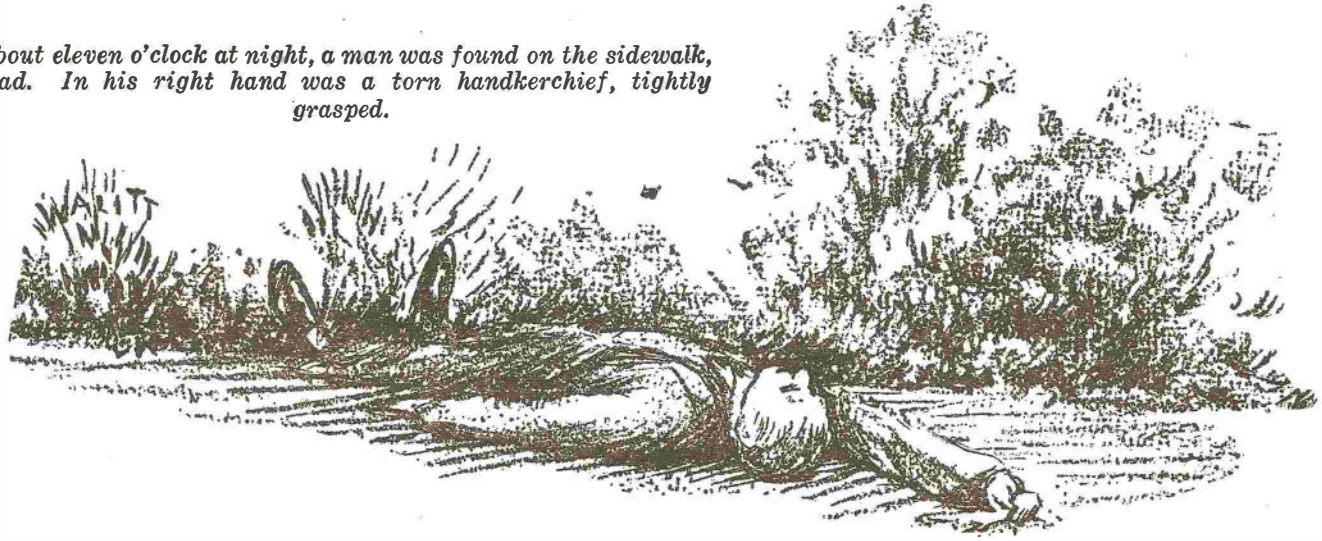
"Offer accepted with thanks. Coming at once. O'Glee."

Brown next saw Jackson and arranged with him to go to Parry Sound and assist in fitting up the house. He invested in a gasoline engine and dynamo, a storage battery, electric lights, plenty of wire, switches, push buttons, insulations, etc., and had them shipped at once.

Dr. and Mrs. O'Glee arrived the day before the wedding, which was celebrated in Parry Sound, accompanied by the first snowfall of the season. All the party then repaired to their new home.

Next day Jackson's brain-waves were charted and the apparatus for his treatment installed. The treatment was given during the night. His days were left free for any work that was needed. He usually helped Brown

About eleven o'clock at night, a man was found on the sidewalk, dead. In his right hand was a torn handkerchief, tightly grasped.



in his prospecting for silver. Snow was no barrier to the new plan, for a vein could be found through the snow as readily as when the ground was bare.

At first Jackson seemed to be smarting under a sense of injustice and a feeling of hostility to society in general. The relative security of his present position soon developed a measure of self-respect and independence, and materially assisted in bringing about the mental change the doctor was aiming at. The elevated tone of the conversation all about him, which was such a contrast to all his former experience, gave him a new viewpoint. There was in it a note of service, a desire to be helpful to all who were in need, and a complete absence of the self-seeking that had surrounded him since boyhood. At first he considered this to be a surface veneer, and looked for the expression of "the old Adam" to burst through at any moment. But as the weeks wore on and the same unvarying kindness showed in every word and deed, he began to think that these people were living in another world from his own. The contrast was so great that he began to despise himself and his former associates.

One day he talked with Brown on this subject.

"The people I have lived with make their own desires and their own advancement their one aim in life, and they are ready to quarrel and fight with any one who interferes with them. If a man got into my way, my greatest delight was to kick him out. Looking back on it now, it seems to me that most of my time was spent in hating other people and in planning to get even with them. You all seem to be different. You do as you wish to, and you get your own way even more than I did, without any fighting or quarreling. And you are not trying to down anybody. Your life is better in every way than mine. What can I do to become like you?"

BROWN had been brought up in a Christian home where the virtues of love, joy, peace, and righteousness were fully inculcated. In his active life he had taken this condition for granted. He had paid little attention to religious theory; but now he felt lost. Here was a man who wished to be led out of darkness into the light, who had appealed to him for advice, and he was unable to give it.

"Jackson," he said, "I don't know any other way of living the best kind of life than just to live it. Quit doing the wrong things and do the right. After a while it becomes a habit and is easy. I was brought up that way and never was in the position you find yourself in. But I think you are started right, and you just have to keep on."

"Do you think the police will give me a square deal? They have always seemed to me like an enemy."

"I suppose the experience the police have had has not been such as to lead them to put much confidence in expressions of good intentions. But I think that if you went to the chief and told him your aims for the future he would at least treat you fairly."

Jackson kept on as he had started, and before the winter was over they were all fully convinced that he was a new man.

Brown had found another vein of silver, two miles to the north of the first. Jackson was now as keen in the search as he himself, and was getting a good knowledge of the apparatus.

Jackson had kept up an irregular correspondence with his former chum, Currie, who had been arrested with him. He had given Currie glowing accounts of his temporary home, and had also informed him of the supposed object of his treatment, and of his confidence that it would succeed. Of his more recent thoughts and his thorough dislike to their former life, he had said nothing. About the time of Brown's discovery of the second silver vein, Jackson received a letter from Currie asking whether Dr. O'Glee would be willing to give him the same treatment, and made an offer of five hundred dollars for it. Jackson consulted the doctor.

"I wouldn't get Currie here just to have his waves changed for five thousand dollars, Doctor; but he is a good fellow at heart, at least I have thought so; and I think a few months here might do him a world of good. Do you think it would?"

"Very likely it would," replied the doctor. "It is worth trying. Yes, tell him to come on, that we won't guarantee success in the treatment, but we will do our best for him."

Currie arrived, and his treatment began. During the days he assisted Jackson in opening the new silver vein, in which his interest was intense. One evening he said to Jackson: "If we work things right we can get something good out of this. We can make a place to hide the stuff, and carry some with us from the vein every night. Gosh, this is a cinch."

"Don't start anything like that this early," Jackson said. "Leave it till later. There is no danger of the mine running away, and there will be plenty of chances to do what we want to later."

Currie agreed, but occasionally he referred to the matter as something he was looking forward to.

DURING the winter Dr. and Mrs. O'Glee, frequently assisted by Mrs. Brown, were busy making a chart of the brain, indicating the various centers of activity, and measuring the waves from each. The doctor's aim was to be able to find in a child's brain all the active and latent capacities, so as to be able to know just what lines of development were worth while, and in what lines the child could excel.

"Everybody should have at least one specialty," he said. "The trouble with the world now is that most of us are only half-developed. If everyone were able to do at least one thing well, life would be better all round, and fewer people would drift into crime."

In February, 1938, an epidemic of influenza began in New York. This was not anything new. In the last years of the World War it had spread from Asia all through Europe and America. At intervals since then it had made threatening advances in different localities. The strong suffered as much as the weak, because the strong tried to fight it off, and experience showed that in such a fight the disease usually came out ahead. Complete rest is the best ally. A goodly number of serums had been tried, with variable results. About the only definite conclusions that had been formed regarding its treatment were, that acidosis must be overcome as promptly as possible, and that the patient must rest.

The epidemic spread rapidly. Three days after its appearance in New York it broke out in Toronto. After that it appeared to be anywhere and everywhere. It struck Parry Sound, as Mrs. O'Glee and Mrs. Brown learned one day when they had gone into town. There were, that day, seven new cases and one death.

On their way home the two ladies discussed the situation. "What is the advantage of having a machine for making waves if it can't be made use of at a time like this?" said Agnes. "Can't the doctor find a wave that will stop this epidemic?"

"He is so much interested in brain-waves that he can't think about anything else," said Mrs. O'Glee. "I doubt whether he even knows that there is an epidemic."

"Then we will have to wake him up," Agnes said firmly.

On their arrival the ladies called a conference and demanded immediate action. What they wanted to know was (1) whether the doctor knew of a wave that would combat influenza, (2) whether such a wave could be broadcast with sufficient power to be effective, (3) whether that could be done before things got any worse.

The doctor replied categorically: (1) Yes. (2) Possibly. (3) Certainly.

The men got to work immediately. The doctor unpacked the machine he had used in the Point Grey attic room for the treatment of Norine and went over to it to be sure that everything about it was in perfect order. Brown put up the wires needed to convey the electric current to the roof, where Jackson was fitting up an out-door shelter for the broadcasting machine. Before dark everything was ready and the current from the storage battery turned on. The night was clear and cold.

Toward noon the next day the doctor went to town to learn of the progress of the epidemic. The health officer informed him that there was one new case, and no other death. This was satisfactory at any rate. The broadcasting was continued for eight days more. There were no more new cases and no more deaths. By the end of another week all the sick were well on their way to recovery, and the health officer was of the opinion that the epidemic was over, so far as Parry Sound was concerned.

"Well," said Mrs. Brown, "the tide turned as soon as we began operations. I wonder if we could be equally successful, or equally fortunate another time?"

"It is quite satisfactory," said the doctor, "that our first attempt seems to be a success. The experiment is worth another trial. In fact, one apparent success would make up for several failures."

After a pause Mrs. O'Glee said: "I wish there was some way of knowing what the probabilities are of this result being merely a coincidence. Mr. Brown, you have had a lot of mathematics. Can't you make a calculation?"

"Certainly, Mrs. O'Glee. Let us assume that statistics show that an epidemic of this kind is liable to continue for any length of time up to thirty days and then suddenly stop. Then the probability of coincidence would be one in thirty. If we assume that a sudden cessation of the epidemic occurs only once in ten times, the probability of this being a coincidence only would be reduced to one in three hundred. If we assume——"

"But Mr. Brown, that is not what I want. You may go on making assumptions without end, and finally make out that, on certain assumptions, no coincidence was possible. Then what better off would we be. We might as well begin with that conclusion."

"Mrs. O'Glee," said Brown, "the only use of mathematics is to enable you to get out of your premises what is already in them. They can't give you anything that is not already there. When, as in this case, the premises are doubtful, mathematics can't give you a certain conclusion."

"How would it do to discuss this question with the health officer?" Mrs. Brown suggested.

"Not unless you are ready to be put in an asylum," Brown replied. "If there is any set of men, who systematically fight against a new idea, it is the medical fraternity. All history proves this. An ordinary doctor would rather take poison than take in a new idea."

"Do you mean he would rather *give* poison?" said the doctor, laughing. "It takes all sorts to make a world."

CHAPTER IX

Dr. O'Glee Writes a Letter

WHEN the epidemic had subsided Brown remarked that he thought it a mistake not to let the public know what was being done. "Of course," he said, "many people will not believe it; but those who do their own thinking will want to try it out for themselves, and they ought to have the opportunity. There is no use in writing to a medical journal. They are too hidebound, or too fearful of offending some of their advertisers. I suggest writing to the Toronto *Sunday Morning*."

The doctor said he had been thinking the same thing. "It will stir up no end of trouble; but I suppose that will not make much difference to us, and it may help some poor fellow who needs it badly. What do you say, Ada?"

Mrs. O'Glee and Mrs. Brown both thought it should be done, though they were a little afraid of the consequences. Johnson, when asked his opinion, said: "Sure thing! Go ahead. I'm with you."

"The blood of the martyrs, you know," said Brown with a laugh.

So the letter was decided on. Mrs. Brown volunteered to do the typewriting. The doctor slowly dictated an account of the principal events of the past year. He began wtih the part played by the radio-detector in the discovery of gold and silver, and in finding Norine when she was lost in the forest. Norine's former condition was described, and her cure. Jackson's transformation of character, and the steps taken to stay the epidemic followed. Fictitious names were used, but the doctor insisted on signing his own name to the letter.

The letter was published in the next number of the Toronto *Sunday Morning*. It was not even noticed by the other papers. *Sunday Morning* sent a reporter up for further particulars, which were freely given. The next week's *Sunday Morning* had a brief editorial calling attention to the letter and stating that they were investigating this remarkable story and would have their report ready for the press next week.

The report appeared as promised, with a full account of Brown's successful efforts with his radio-finder for gold and silver; photographs of Norine before and after treatment; of the attic room in Vancouver; the house in Glen Eagles; the mountain where Norine was lost; the house near Parry Sound; the machine used to combat the epidemic; etc. In fact, almost the whole edition was occupied with this one story, and opinions of various representative people about its probable truth, and its importance if true. Two radio engineers thought it highly probable. The chief of police said it was nonsense. Several physicians declared it a fake, and compared it with the claims of Mesmer. Some business men were non-committal—there might be something in it. The professor of physics at the university said it was quite among the possibilities.

Newspaper comments were equally varied, but most of them admired chiefly the ingenuity of the editor of *Sunday Morning* in writing up an interesting story.

So much publicity had one unpleasant effect. As Brown and the doctor (whose pictures had appeared in *Sunday Morning*) were walking along Bloor Street, near Yonge, a policeman accosted the latter and inquired his name. When it was given he was informed that he was under arrest, and must come to the station immediately. Arriving, the police magistrate informed him that he was arrested on a warrant issued some months before, on a charge made by Wardel for kidnaping his daughter. Protest was useless. After some delay bail was fixed at $10,000, and security given.

Brown immediately telephoned Wardel, informing him of the arrest and asking if he wished to press the charge, or whether he was willing to withdraw it. Wardel expressed the deepest regret; said he had completely forgotten about the warrant, and that he would have it canceled without delay. An hour later he telephoned that he had learned from the magistrate that the charge could not be withdrawn without the consent of the public prosecutor, and that the latter official had positively refused his consent. The case, he said, must go on to a trial. Wardel was profuse in his apologies to the doctor, and promised to do everything in his power in the doctor's behalf.

There was nothing to be done but to engage an attorney, give him all the facts, and await the trial.

In the meantime both the doctor and Brown moved to Toronto, leaving Jackson and Currie to open up the two new silver veins that had been discovered during the winter.

BEFORE the trial Brown engaged an office not far from the courtroom, and borrowed the doctor's broadcasting machine for some experiments he wished to try. He also consulted the doctor about the control of emotions by means of ether waves, and learned that the waves producing anger, fear, enthusiasm, sorrow, and amusement, had been definitely measured.

The doctor's attorney, Thomson, advised him to plead "Not guilty" and to say as little as possible, leaving it to the prosecutor to make out a case against him if he could. Dr. O'Glee refused. He said he was not guilty of any crime, and that he would tell all the facts and leave it to the common sense of the jury to acquit him. "In that case," said Thomson, "you run a considerable risk; for the prosecuting attorney will do his best to give the facts such a twist as will make them have an ugly appearance to the jury. However, if that is your decision, I will do my best for you."

Brown did not attend the trial. He excused himself on the ground of a very important engagement at his office.

The charge was read: "That you, Timothy Simpson O'Glee, on the tenth day of May in the year one thousand nine hundred and thirty-seven, did, wilfully and feloniously and with intent, and without the knowledge or consent of her parents or either of them, remove from her home and from the city of Toronto, and take to parts unknown one Norine Wardel, to the great grief of her parents and against the statutes for such case made and provided."

"Prisoner at the bar, are you guilty or not guilty?"

"Not guilty, your Honor."

Mr. Wardel was the first witness called. He gave the facts as far as he knew them, including the backward condition of the child when he handed her over to the care of Dr. and Mrs. O'Glee, and her return in perfect mental and physical health.

Taking the stand in his own defense, the doctor corroborated Wardel's evidence, and added particulars of the intelligence tests and of the treatment Norine had received. No other witnesses gave any material evidence.

Attorney Thomson called attention to the fact that the girl's parents had given their consent to the treatment, and that Mr. Wardel had personally given her to the O'Glees for that purpose. He argued that when the O'Glees moved to British Columbia it was naturally taken for granted that they would take Norine with them. To make any other supposition would be absurd. In any case there was clearly proved the absence of any evil intention on the part of the accused, and it remained only for the jury to bring in their verdict exonerating him from all blame. The misunderstanding which had arisen, which was partly due to the accidental loss of a letter in the mails, was unfortunate, and had caused a great deal of worry, but it was not altogether the fault of the accused, and was not criminal. The splendid results of the treatment were further proof, if more were needed, that there was nothing criminal in the whole transaction.

The prosecutor said he was unable to take the mild view of this crime that was taken by the attorney for the defense. He called the attention of the jury to the case of Loeb and Leopold, who seized a young boy on the street in Chicago and tortured him to death, about fifteen years ago. Owing to the special pleading of their attorney they were given, instead of the electric chair, imprisonment for life. The attorney detailed the long list of similar murders that had followed this leniency.

In the present case the accused had practically admitted his guilt. Whatever his object was, he had evidently feared to carry it out, and the girl was unharmed. The father was no doubt glad to make a bargain to refrain from prosecuting the accused if his daughter were restored to him. That was only natural, but the jury should not allow themselves to be influenced by it. They were the guardians of the public safety. If this criminal were set free, other like crimes were liable to be committed, and they could not depend on the cowardice of the next abductor to let his victim be returned. The guilt of the accused had been fully established by the evidence, and the evidence admitted by the accused. The prisoner should therefore receive the full penalty provided by law.

Judge Boyne contented himself with giving a summary of the law, and left the facts with the jury.

After an absence of one hour the jury returned. As the foreman announced the verdict "Not guilty" a broad grin overspread his face. The prosecuting attorney smiled, sarcastically. The doctor and his attorney smiled, delightedly. In a few moments the whole room was convulsed with laughter. Unable to secure quietness the judge ordered the courtroom to be cleared. Some one outside asked one of the men who had just left the courtroom what there was so funny about the verdict. The reply was: "There wasn't anything funny about it. That is why everybody laughed."

Opinions differed about the verdict, but the general impression was that there was something fishy about the whole trial, and especially about its closing.

Next day Judge Boyne received a letter threatening to "get even" with him for discharging the accused—though the judge had no option in the matter. This letter was handed over to the police. Brown, who happened to hear of it, obtained permission to take the letter to an expert in chirography for examination. Before doing so he examined the letter carefully with his receiver, found the characteristic waves in it, and selected some of the most unusual of these for use.

Fortunately for Brown's purposes, the Post Office inspector had learned that the threatening letter was found in a box at the corner of Richmond and John Streets. It seemed likely, therefore, that the writer would be discovered in that vicinity. Late that evening, when the streets were comparatively quiet, Brown placed his receiver in his auto, using a single ear-phone, and drove slowly along near the intersection of those streets. Next evening he continued his search, extending it to adjacent streets. He was rewarded by finding two houses that gave out the kind of waves he was looking for. Next evening, extending his search, he found two more. The fourth evening was spent in confirming his previous findings, and in locating the exact rooms from which the radiations came.

In the meantime he had wired Jackson and Currie to come to Toronto. When they arrived Brown showed Jackson the results obtained, and asked him if he could find out who lived in the suspected rooms, and if he could contrive to get a scrap of writing, or in default of that, any scrap of material such as a piece of clothing, from each of the occupants.

Jackson readily undertook the task, and the second day afterward he gave Brown four scraps of paper, three of which contained writing, the fourth some pencil sketches.

The rays from these were compared with the original letter. Only one, the one containing the sketches, was found to agree with it.

Brown then called on Judge Boyne, told him that he had found the writer of the threatening letter, but that it would be necessary to get a specimen of the culprit's handwriting, so that the expert might compare it with the letter. The judge agreed to have the man arrested by the police, who would be instructed to search for a specimen of his writing. This was done, the handwriting

obtained and handed to the expert. On the evidence of the expert the prisoner was convicted.

CHAPTER X

Alarm in the Underworld

JACKSON warned Brown that the underworld suspected that he had some occult plan of tracking down a criminal, and that it would be safer for him not to be out alone at night. Dr. O'Glee seconded the warning. "You have been altogether too active in criminal matters lately for your own good." Brown promised to be careful.

A few days after this warning, about eleven o'clock at night, a man was found on the sidewalk on College Avenue, near Bathurst, dead. The body was still warm when found. In his pocket was an old letter addressed to William K. Brown. A bullet had passed through his left arm just above the elbow. Another had entered the right temple. In the victim's right hand was a torn handkerchief, tightly grasped. His money and his watch were untouched. The passers-by were frequent at that hour, but no one could be found who had heard a shot. Apart from the handkerchief, and the calibre of the bullet, there was nothing in the nature of a clew to trace the murderer.

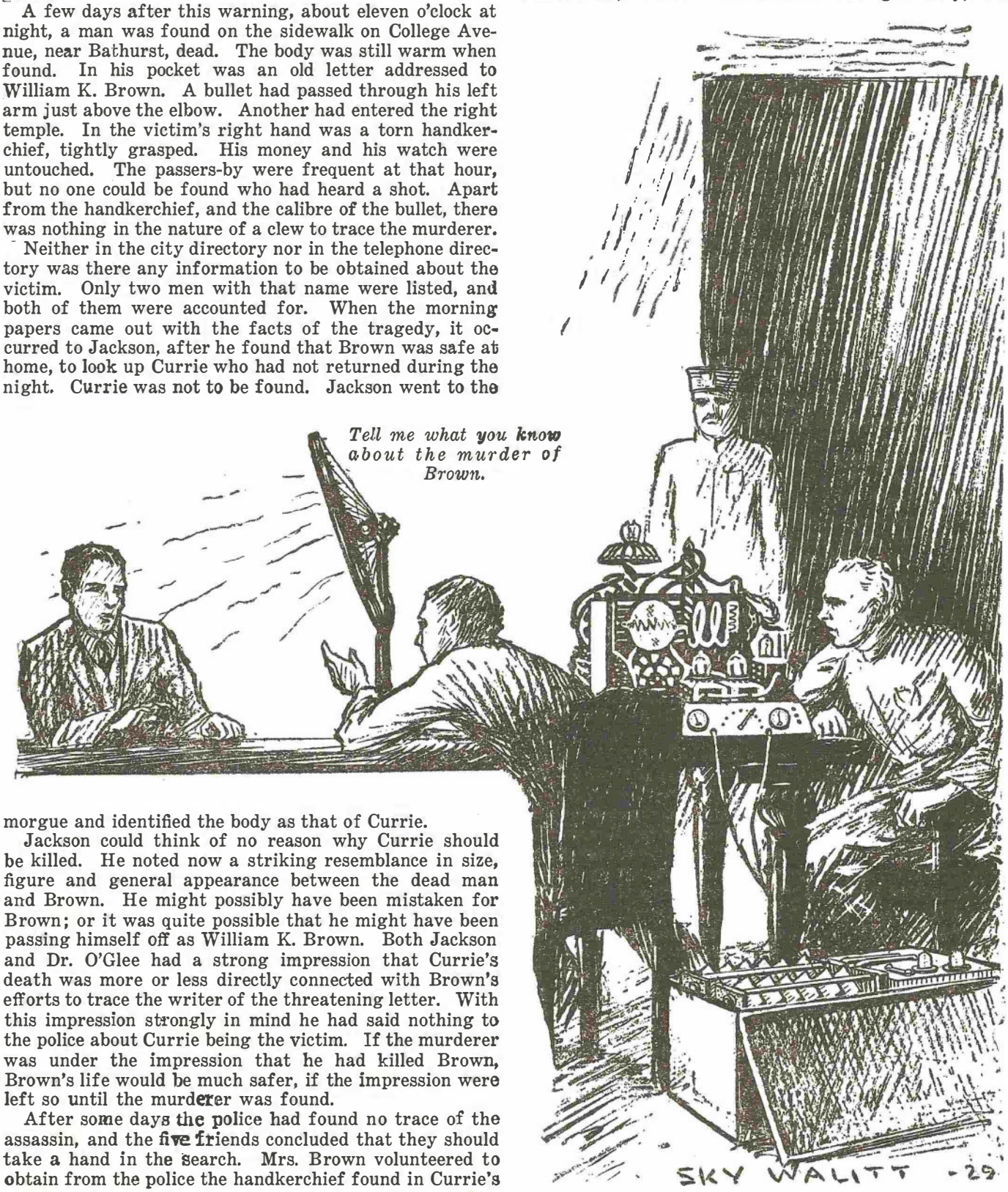
Neither in the city directory nor in the telephone directory was there any information to be obtained about the victim. Only two men with that name were listed, and both of them were accounted for. When the morning papers came out with the facts of the tragedy, it occurred to Jackson, after he found that Brown was safe at home, to look up Currie who had not returned during the night. Currie was not to be found. Jackson went to the morgue and identified the body as that of Currie.

Jackson could think of no reason why Currie should be killed. He noted now a striking resemblance in size, figure and general appearance between the dead man and Brown. He might possibly have been mistaken for Brown; or it was quite possible that he might have been passing himself off as William K. Brown. Both Jackson and Dr. O'Glee had a strong impression that Currie's death was more or less directly connected with Brown's efforts to trace the writer of the threatening letter. With this impression strongly in mind he had said nothing to the police about Currie being the victim. If the murderer was under the impression that he had killed Brown, Brown's life would be much safer, if the impression were left so until the murderer was found.

After some days the police had found no trace of the assassin, and the five friends concluded that they should take a hand in the search. Mrs. Brown volunteered to obtain from the police the handkerchief found in Currie's hand. It was decided that the doctor and Jackson should set out to explore the electric waves given off by criminals, especially murderers.

Jackson took Brown's receiver and went to the penitentiary at Kingston, Ontario, to study the characters of criminals. Dr. O'Glee went to Sing Sing for the same purpose. On their return they compared notes.

Three-fourths of the murderers examined emitted a wave that was found in only a few of the other criminals. This they named (for the present) the murder wave. In practically all of the murderers there was complete absence of the wave representing conscientiousness. From these data, which were somewhat fragmentary, but



Tell me what you know about the murder of Brown.

was all that was available, they proceeded to develop their plan. Mrs. O'Glee proposed that they secure four or five rooms, each about two city blocks from where the body was found, say north, south, east and west of it; and each of them take a detector and search for murder waves. If they could not find any, they should get other rooms in the most likely places to find criminals, and continue their search. This plan met with the approval of the others. The doctor and Jackson proceeded to make three more detectors. In a few days these were ready. Mrs. O'Glee had engaged four rooms for their purpose.

In the evening they repaired to their several posts and began their search. Several indications of the murder waves were found, but the searchers repeated their examinations until there was no doubt in their own minds. Large-scale maps of that part of the city were obtained, and the lines of direction of the waves found were marked on these as accurately as possible. One of the detectors was then placed in an auto, and from fixed positions new lines of direction were found and drawn on the maps. The points where the lines crossed gave the location of the houses sought. The auto was then placed closer to each of the houses in turn, and, where possible, the room generally occupied by the supposed murderer was found. At the same time, from this nearer survey, it was possible to compare the waves from each room with the waves from the handkerchief.

The result of ten evenings of this work was that eleven suspected rooms were located, and that nine of them were found to give waves that were not comparable with those from the handkerchief. The other two sets of waves were practically identical with those that came from the handkerchief.

"Isn't it dreadful," said Agnes, "to think that there are so many murderers around us. I can hardly believe it possible."

"It is not possible," the doctor replied, "or at least not at all probable. The places we have found are the residences of potential, not actual, murderers. Most of these people will probably spend their whole lives as reputable citizens, or at least will not be regarded as dangerous criminals. But if it happens that some strong incentive to kill comes along, they will yield to the incentive. They, above all others, should pray, 'Lead us not into temptation.' I think we will find that what we have called the murder wave will turn out to be identical with the wave of hatred. You know 'He that hateth his brother is a murderer.'"

It seemed now that the assistance of the police would be required Jackson was commissioned to find the names of the residents of the suspected rooms. The doctor arranged for an interview with the chief.

At this interview the doctor explained the use of the radio in the detection of minerals; told of how the same method was used to find Norine when she was lost; and how Brown had discovered the writer of the threatening letter. Finally the doctor said: "Chief, you have listened to me patiently, but I know that you have not much confidence in what I have told you. Without actually seeing something of this kind it is almost impossible for you to believe it. Will you come to my house and let me show you how we discovered minerals?"

"I will go with you at once," the chief exclaimed. "If half what you tell me is true it is the biggest thing I ever heard of."

THE demonstration was made to the chief's satisfaction. "Now," said the doctor, "you are ready for the next step." He detailed to the chief the steps that had been taken to find Currie's murderer; and asked him to arrest the two suspects and hold them for further examination. "Then," he said, "I would like to show you another machine."

The suspects were arrested early that evening. Shortly afterward the doctor arrived with his broadcasting machine, which he connected with the electric lighting circuit. He asked that one of the prisoners be brought in, and adjusted the dial of his machine. When the prisoner was seated he pointed the machine toward him, turned on the switch, and waited a few minutes in silence. Then he addressed the prisoner.

"Tell me what you know about the murder of Brown."

The prisoner hesitated at first, looking rather sullen. Then with a half-laugh he said:

"That guy, Brown, was too smart to live. If I hadn't done for him, us fellows 'd have had no chance at all."

At this point the chief interrupted him to say: "You must remember that you are in the presence of an officer, and that anything you say here may be used as evidence against you."

"That don't matter, Chief, It's all the same to me. As I was a-sayin', that guy was no earthly use, so I bumped him off. He was worse than a bloodhound; he was."

This prisoner was removed, and the second man brought in and placed under the same conditions. After a few minutes the doctor asked him the same question.

"I don't know nothin' about it," he said. "Brown sure got what was comin' to him. If I had been there I might have helped, but I wasn't, and I don't know nothin' about it."

When this prisoner was removed the chief looked at the doctor in amazement. "What kind of witchcraft is this?" he said.

"This is what I call the 'Third Degree.' No doubt you have heard of it before."

"Do you mean to say you have a machine that makes it impossible for a man to lie?"

"No, not impossible; only more difficult. You can draw your own conclusions. By the way, has the revolver been found? And the Maxim silencer?"

"Yes. They were both found in the first prisoner's trunk. This is most extraordinary."

"Then the second man may be released—until he kills somebody."

As they passed out the chief remarked: "No wonder the crooks wanted to kill the inventor of a machine like that."

One evening at a club meeting the chief met Judge Boyne, told him of the things he had seen and heard, and recalled the write-up that had appeared in the Toronto *Sunday Morning*. The judge was as much impressed as the chief himself; but the only remark he made was that this is the Psychological Age.

CHAPTER XI

The Riot

WHEN the trial came, Judge Boyne was on the bench.

On his attorney's advice, the accused denied his guilt, and denied that he had made a confession. The trial was brief. The confession was placed in evidence, as well as the revolver and the Maxim silencer. The jury without leaving their seats brought in a verdict of "Guilty."

The sentence pronounced was unique—life imprisonment with hard labor, "and to serve as a subject for experiments approved by the court for the detection and prevention of crime."

This sentence had some remarkable results. The Prisoners' Aid Society saw in it a "cruel and unusual punishment" against which it was their duty to protest, and they immediately began an agitation against it. On the other hand, the advocates of "a life for a life" entered a strong protest against life imprisonment being made a substitute for the electric chair; referring again to the

series of crimes that had followed a similar clemency in the Loeb case in Chicago fifteen years ago. In the third place the underworld of Toronto, which appeared to keep more closely in touch with anything new than did others of the community, who were less directly interested, saw in this sentence a possible increase in the power of the police, and less security in their vocation; and they, too, carried on in their own world a persistent agitation.

A result of this accidental co-ordination of three classes of society against the sentence was, that intense hostility was roused against Judge Boyne. The judge was openly insulted by some hoodlums—who are quick to sense the public attitude. Threatening letters were frequent. And it was thought best to keep a guard in the judge's home.

The hostility culminated one evening in a demonstration in the street opposite the judge's house. A mob of six or seven hundred people quickly gathered, and when the police charged with batons, the mob drove them back with sticks and stones. A riot call was sent in, and the police retired to wait for reinforcements. In the meantime the bolder spirits of the mob were trying to find a way of breaking into the house, where the guard was ready to receive them warmly in case they succeeded.

When the first news of the mob was broadcast to the city by radio, Dr. O'Glee called up the chief of police and asked that an officer be sent to his residence at once to take him to the scene of the riot. This was done, and the doctor, with his apparatus, was driven along the lane of the block facing the judge's house. The officer obtained entrance to a house opposite the mob, and demanded the use of a front room. The doctor attached his apparatus to the electric lighting circuit, opened the window wide, and pointed the apparatus at the center of the mob, which was by this time nearly a thousand strong. After a few minutes some of the rioters began to look around fearfully. In five minutes many were sneaking off. In ten minutes half the rioters had disappeared and the rest were preparing to follow their example. When the reinforcements arrived with rifles and a machine gun, twenty minutes after the doctor's arrival, the street was deserted.

"Yes," said the doctor on the way home, "in fighting a mob Fear is better than Force."

Next morning Judge Boyne and his family took an airplane for New York, and thence went by airship to London, on a six months' vacation.

Mr. and Mrs. Brown and Dr. and Mrs. O'Glee decided that a summer in the Highlands of Scotland would give them a much needed rest.

Jackson was engaged by the chief of police as his special assistant; and undertook to look after the silver mines during the owner's absence.

CHAPTER XII

The "*Weekly*" Reviews the Situation

THE *University Weekly* for May 28, 1938, contained the following editorial:

"For the first time for more than a generation Toronto has been disgraced by a riot. It was a demonstration staged by the lowest criminal class of the city, and was directed against law and order as represented in the person of Judge Boyne. The immediate cause of the riot was a sentence given by the Judge to a murderer, namely, 'My sentence is that you be imprisoned for the term of your natural life, and that during that term you shall serve as the subject of experiments approved by the Court for the detection and prevention of crime.'

"The Judge evidently referred to the now well-known experiments of Dr. T. S. O'Glee and his associates, who have shown that in some cases a criminal may be traced, and his connection with the crime proved, when all the ordinary means of identification, including finger prints, are absent. This is accomplished by means of short electric waves and a detector which is made after the general plan of the radio receiver. It was rumored in the underworld that this detector was the invention of William K. Brown, an associate of Dr. O'Glee. A man who was supposed to be Brown was found on the sidewalk, murdered. In a confession made by the murderer, Brown's invention of the detector was named as the reason for the crime. The importance of the new invention was recognized at once by the underworld, almost before it was known to the police. Judge Boyne's sentence indicates that he was aware of the new method of detection, and aimed at its extension and improvement. Hence the attack on the Judge's home, which was evidently aimed at his life.

"There have always been a few philosophically minded people who claim that there is no such thing as wickedness; that all so-called wickedness is sickness, or is due to a disordered organism; and that the change commonly called conversion or regeneration is a cure or correction of the disorder by spiritual, psychic, or emotional forces. Dr. O'Glee considers that the disorders that lead men to crime have a physical basis, and that they may be corrected by physical energy in the form of short ether waves. He claims to have effected such a transformation in at least one case by such means. We see no reason why ether waves should not be just as efficient as sound-waves, which are given credit for most of the conversions claimed.

"The use of electric waves in the healing art is not new. As far back as 1927 George Lakhowsky, using ether waves two meters long, succeeded in curing cancers in plants. In the following year, 1928, the U. S. Public Health Service reported promising results in the treatment of cancer in mice, using electric waves twenty meters long. Two years ago came the news that Professor LeGrand, of Nice, was treating patients in various parts of the city by means of electric waves radiated from the top of his hospital, and amplified by means of receivers in the homes of his patients.

"One feels naturally doubtful about Dr. O'Glee's claim that an epidemic was stopped by the direct action of waves broadcast from his house, without the intervention of a receiver. But it must be remembered that his apparatus was very powerful, and the distance short. We do not yet know how small an amount of energy is required to make the difference between health and disease. . . . It cannot be denied, for example, that homeopathic doses of medicine are frequently followed by prompt recovery; and even if we suppose that the cures in such cases are psychic, it remains true that the amount of energy employed was immeasurably small.

"There is a tendency in conservative minds to discount anything new. The first steamer that crossed the Atlantic carried a letter from a savant proving that such a thing was impossible. Sir Jagadis Chandra Bose, the greatest of all modern physiologists, was refused permission to present his experiments before the Royal Society, because they did not harmonize with the theories of some of the members. Conservatism is good, but it can be easily overdone. And when it is based on ignorance, jealousy, or cupidity, it is something to be ashamed of.

"The restoration of a sub-normal child is declared by most physicians to be an impossibility. The frequent use of glandular extracts, X-ray irradiation, etc., are evidence that all physicians are not ready to admit that a cure is impossible. Dr. O'Glee has proved that in some cases restoration is possible by means of ether waves. While this does not mean that all children are capable of elevation to the rank of geniuses, it does

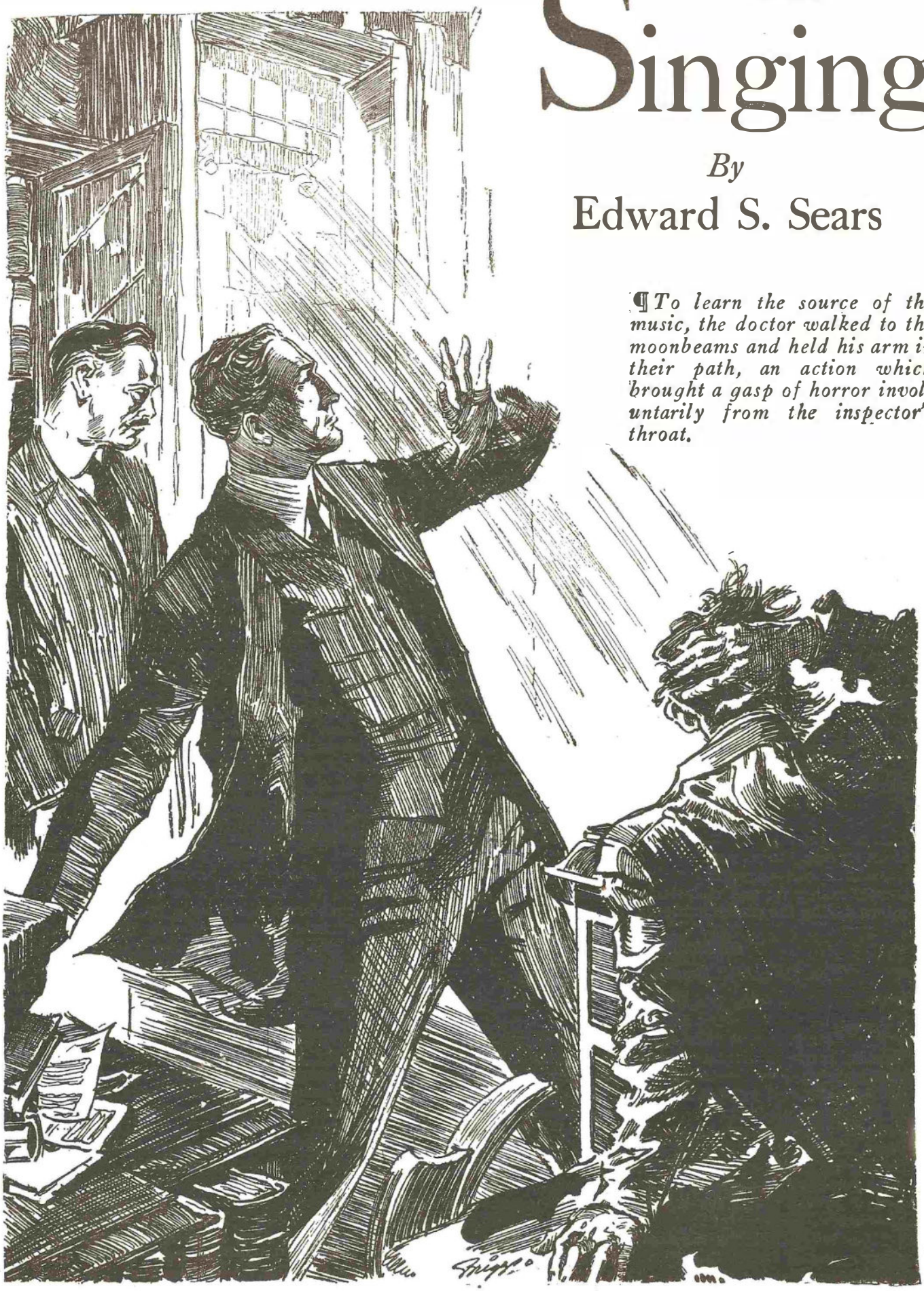
(*Continued on page* 429)

The Singing

By

Edward S. Sears

¶To learn the source of the music, the doctor walked to the moonbeams and held his arm in their path, an action which brought a gasp of horror involuntarily from the inspector's throat.



Moonbeams

THE problem of wireless transmission is to confine it to a straight path. At present, it radiates in all directions and can be picked up by anyone. But suppose a ray could be produced which the emanations from a wireless transmitter would closely follow—which would be a path for the message. Then an important problem would be solved. On the other hand, strange effects could be produced by this ability to send out mysterious messages into space. Like other inventions of beneficial tendencies, it could be diverted to malicious purposes and criminal uses could easily be found for it—uses which might baffle many a clever detective.

IT was nearing midnight. In a stately old mansion, far up Fifth Avenue, New York, a man stood watching in an upper room, with dread in his every action. His fifty years had not aged a vigorous frame, though they had grizzled his hair. The firm, resolute lines of his mouth, the keen, understanding eyes, the massive shoulders, all belied the look of terror in his face. The room was darkened, but he stood outlined near the open window, as the moon rose higher and higher until the long, slanting beams reached the window sill.

As the moonbeams touched the corner of the room, the big frame of the watcher in the silent chamber quivered with emotion. It was evident that he was watching the moonbeam. As it crept farther and farther into the room, his breathing was a scarcely audible hiss.

The furnishings of the room were elegant; the bed, a Sheraton design, with delicate lines of inlay, stood on one side of the room; a highboy, of classic conception, occupied one part of the wall on the other side. On the wall nearest the bed was the painting of a lovely woman, done by a masterhand; a woman in the costume of Carmen, in whom opera lovers would have recognized the famous Norah Lorenz of the Metropolitan, who had been dead only a few weeks. Across one corner of this great room was a fireplace of such proportions that an ox might have been barbecued over its huge andirons.

Opposite the window was a cabinet of beautiful workmanship. It might have been for music, or for radio, or for phonograph records. Its exquisite carving was further ornamented by lines, not of wood inlay, but of mother of pearl and some semi-precious stones.

The moonbeams were traveling slowly toward this cabinet, but to the man who was watching, their progress was remorseless. As the silver flood crept over the cabinet, the gems of its inlay seemed to take fire. They were bathed in unearthly radiance that filled the luxurious chamber with cold flames.

Over the top of the cabinet the moonbeams climbed until they caught the line of inlay about the top. The man who was watching became ghastly in hue. He waited. Then, as he gazed at the cabinet with eyes that stared wildly, almost insanely, a faint strain of melody, like the tinkling of tiny, delicate bits of glass, broke from the moonbeams. It sang in a voice, an angelic soprano, that filled the "Rosary" with desperate pleading.

And as the song rose higher, never great in volume, but ghostly in ethereal purity, the man sobbed. He made no effort to check his emotion. The progress of the moonbeams was slow. The last strains sank to a whisper.

"And at the last I learn,
To kiss the Cross, sweetheart,
To kiss the Cross."

For an instant the moonbeams were silent, while the sobbing of the big man who listened grew in intensity. Then the moonbeams began to sing again. And the strains of "Annie Laurie" came in the same melting, delicate soprano, until the beams had traveled across the cabinet. The unearthly voice of the moonbeams continued to the end of the song.

"And for Bonnie Annie Laurie,
I'd lay me doun an' dee."

The words came as the moonbeams, which had so agitated the watcher, waned and left the room in obscurity.

The man fell to his knees before the picture. Tears were streaming down his face as he moaned and babbled incoherent words.

"Norah, Norah, why is only your voice left to me?" he said. "Why couldn't you have stayed with me? It is driving me mad to hear your voice every night and know that you are gone forever. I cannot bear it. I cannot bear it."

Exhausted, the man fell across the bed and, after a period of intense emotion, slumbered. The music, which had so terrified him, was at an end.

THE next day Inspector Craven of New York headquarters was sitting at his desk, opening his mail and answering numerous phone calls. He was gnawing at a big cigar, at the same time pulling impatiently at the ends of his moustache.

"Yeah," he muttered, "wonderful days for a copper. Here's a Denver chief wants me to look up a wife deserter. Los Angeles is after a bird that owes them a year or more for peddling booze. The rest of them are booze or hop heads. Not even a bank robbery or a slugging."

The telephone rang and Inspector Craven dragged his massive shoulders reluctantly forward. He straightened up, however, as he recognized the voice addressing him.

"Why, hello, Judge Sterling," he said. "I thought you were sick abed. Terrible blow to lose Mrs. Sterling. I'd be glad to render any service I can. Hope you'll soon be able to get back on the bench. We miss you a lot, you know."

"Thank you, Inspector," replied Judge Sterling. "I'm under a terrible strain here. I have the servants, of course, but this house is beginning to get on my nerves since Mrs. Sterling died. I wonder if you can spare time to get up here to-night. Come just before moonrise, will you? The moon rose at twelve last night. Come a bit before one to-night."

"Good Heavens!" cried the inspector, as he hung up the receiver, "this is the limit. To add to the rest of my troubles a sick judge wants me to sit up and watch the

moon with him. The devil! I wish some bootlegger would get shot up, so I couldn't go."

"Why, Inspector," said a genial voice, "why shouldn't you watch the moon with the judge? True, the ancients believed its rays made people insane, but you're far too intelligent to credit a thing like that."

"Well, maybe your ancients knew what they were talking about, Dr. Jarvis, but because this judge has just lost his wife and sits up and watches the moonlight, there is no reason to drag me into it. I see the moon plenty without staying up all night especially. Tell you what, Doc, he might need a soothing dose. Why couldn't you go up with me? Then I wouldn't have to listen to his raving alone."

Doctor Jarvis, an eminent surgeon, as well as a remarkable student of science, was one of the inspector's closest friends. Inspector Craven had often found Dr. Jarvis's scientific knowledge of the greatest value, and while he grew impatient with his pedantic ways he loved and admired him as a chum. The doctor was about forty years old; the inspector was fifty, but he was, as a facetious friend once remarked, built like a Macedonian phalanx. Both had the same faith in athletics, which was their common bond. Two or three times a week they went to their club, stripped, and boxed two or three rounds. The inspector, despite his vast bulk, had little advantage over the doctor, who, though slimmer, was very tall and had a set of well developed and well disciplined muscles. He had an adventurous quality which endeared him to the inspector.

On this morning, as always, Doctor Jarvis was immaculately groomed. He sat in the chair which the inspector pulled out for him, and with a patent lighter lit a meerschaum pipe. His fingers and wrists disclosed many X-ray burns.

"Seems to me, Inspector," he said, "I remember something unusual about this Judge Sterling. What was it?"

"Oh, he's very rich, for one thing; very cultured. He's one of the ornaments of the Supreme Court. He stayed a bachelor until he was past forty, then, like most old men who fall in love, he fell deeply. Norah Lorenz was knocking 'em all cold with her voice and her beauty and filled the Metropolitan at her première. Judge Sterling sent flowers and began to rush her. She fell just as hard as he did, and at the end of a concert tour they were married. He took a long leave of absence, and they toured Europe. When they returned, their pictures shared the front page of the newspapers with the big Borglum Trust Company robbery. So, it was a big society event to rank on the front page with a million dollar robbery. Two men killed and several of the gang in the pen right now, waiting for their trial.

"Well, that old Gremble mansion on Fifth Avenue had been vacant for two years and what does Sterling do but buy the house, repaper and paint it and load all his fine furniture into it. Five weeks ago Norah took sick in the flu epidemic and died in no time. She's been dead two weeks now, and the judge has been a wreck ever since. That's why I don't want to watch the moon with him. He never stirs out of the house. The servants gum-shoe around as if Norah's body were still there."

"Indeed," said Doctor Jarvis. "No wonder the man's a wreck."

"Oh, they were two lovers all right. Norah liked him the minute she set eyes on him. He's the best educated man on the bench, and the lawyers made Tammany put him there. But he's wool-gathering ever since Norah died. I hate to go into the house. It's too blamed morbid."

AT twelve-thirty that night, Inspector Craven and Doctor Jarvis got out of the inspector's car before the door of Judge Sterling's house. A servant answered their ring and they were ushered into the stately old-fashioned parlor. Under the big chandelier with its forest of crystals, the judge sat in a large chair. He rose to greet them with marked relief.

"You are early, gentlemen. Thank you very much. I suppose, Inspector, this other gentleman is one of your assistants?"

"No, Judge, this is Doctor Jarvis, of whom you must have heard. He came in while I was talking to you on the telephone, so I took the liberty of inviting him to come along. He heard Mrs. Sterling sing when she was known as Norah Lorenz and felt an unusual interest in visiting you. But why, Judge, are you asking me to share your night with the moonbeams?"

"There is a half hour before the moon will strike my chamber. That will give me time enough to tell you what obsesses me. Every night, when the moonbeams enter that room, my wife sings her last two songs—the only two songs she ever sang much after we were married. One night the moon didn't shine. It rained. That night she didn't sing. Each night the moon rises an hour later. And each night with the coming of the moon, comes that song. I'm a man of reasonably good nerves but what would you do, if one of your dearest departed began to sing to you down the moonbeams?"

Inspector Craven, with great self-control, checked an impulse to suggest having his head examined.

"Is it possible, Judge Sterling," asked Doctor Jarvis, "that your radio or phonograph is mixed up in this?"

"The radio could not reproduce my dead wife's voice in exactly the same manner every night. Besides that, the radio programs of the country are not built around the orbit of the moon. As to the phonograph records of my wife's voice, I could not bear to listen to them after she died and I had every single one removed from the house. There is no piano, no radio, no music in this house. I even had my bed springs insulated so that no radio music could possibly reach me. But it is nearing one o'clock. Let us go to my room."

Doctor Jarvis followed Judge Sterling and Inspector Craven up a wide staircase. They traversed a corridor and entered the room which Judge Sterling indicated. He placed a chair for each of them and they sat down expectantly.

The two men did not share Judge Sterling's emotion. Yet, as the moonbeams mounted to the window sill, then began to move across floor and ceiling, the silence became tense. It was an eerie scene, the room drenched in the white moonlight, the picture of the great soprano looking with all the coquetry native to the character of Carmen on the three men.

But even the inspector started as the faint strains of the dead woman's voice floated, apparently down the moonbeams, as they sent a flood of brilliant white and sparkling glory over the gem incrusted cabinet. Judge Sterling buried his head in his hands in the intensity of the moment. His two companions looked at each other, then at the moonbeams progressing slowly across the room. They, too, recognized the two airs which Norah Lorenz had been wont to use as encores.

The thought of radio had been dismissed from both their minds as improbable, for no radio programs were made to start each night with the rising of the moon. All the judge's records of Norah's voice had been removed from the house. But, even if they had not been removed, Doctor Jarvis asked himself, what kind of records would follow the progress of the moon an hour later each night? To learn the source of the music, he walked to the moonbeams and held his arm in their path, an action which brought a gasp of horror involuntarily from the inspector's throat. And even the doctor looked shaken, when the singing stopped for as long as he held his arm in the line of the moonbeams.

"My Heavens, Inspector!" he gasped, "this is no radio. Radio travels in all directions. My hand wouldn't have stopped the sound. Nor is it a phonograph record. That music, as the judge says, is traveling along the moonbeams."

The voice was now almost at the end of "Annie Laurie" and Doctor Jarvis observed that between the words "for" and "Annie" the ghostly singer paused, as if for breath. The last words, clearly tinkling, rang out, then the moonbeams left the room to pursue their way on the wall beyond the window.

The judge was exhausted but less nervous than he had been the previous night. He looked with new interest at Doctor Jarvis, who had dared to meddle with what had seemed to be almost a supernatural manifestation.

"Judge Sterling," said the doctor, rising, "this is the most puzzling experience of my life and I may venture to say, even of the inspector's varied career. What is back of these singing moonbeams I am not prepared to state. We must investigate further. If Inspector Craven is willing to sacrifice some more sleep I would like to come here to-morrow night, an hour later than to-night, provided the weather is clear. If by chance the singing should lose its regular habits and occur earlier, will you call us both by telephone. Such a circumstance would simplify the problem enormously. As you are laboring under considerable excitement, I will, with your permission, administer an opiate. You really need it if anybody ever needed one."

Inspector Craven had taken no part in this conversation. But when he and the doctor had entered his car, he said, somewhat peevishly:

"I don't see why you want to spend another night with those confounded moonbeams. We heard them and that's enough for me. Probably the judge imagined it and we are laboring under some psychic or even subconscious influence and imagine we heard what he described so vividly. Music and moonbeams! That's a nice combination for an inspector of police to write a report about. Just the same, Doc, I'm terribly obliged to you. Real or not, I never admired your nerve more than I did to-night. I wouldn't have stuck my arm through that moonlight on a bet. When that light began to sing, or when I imagined it began to sing, I could hear my heart thump."

"Bosh, Inspector, you know very well we both heard that music coming down those moonbeams."

"What do you make of it, then? What kind of a hocus-pocus is it?"

"I don't make much of it so far. I know that music comes from some human source. Ghosts have no bodies, consequently no tongues and so they cannot sing. Radio, you know, plays queer tricks. I read an account the other day of a woman who had no radio or any other music in the house and she heard a jazz tune, coming, apparently, from a pot of beans on the stove. She stirred up the beans and heard an orchestra. But no radio I ever heard of kept up a schedule with the moon. And it travels in all directions. You can't interrupt it with your hands the way I did to-night. Nor does a phonograph fit in with this ghostly concert."

"It beats me, Doc, but it doesn't seem to me to be a job for the police. Perhaps a scientist or a doctor would do better."

"You're a bit flustered, Inspector, or you wouldn't say that. Assuming, as we must, that this is a human phenomenon, why should anyone serenade the judge every night? Why should anybody try to get him into such a disturbed state? Would anyone, with good intentions, play such a ghoulish joke on the judge?

"We must assume that this act was committed with malicious intent."

"You hit a bull's-eye that time, Doc. That strange experience did shake me more than I'm willing to admit."

THE following night, an hour later than on their previous visit, Inspector Craven and Doctor Jarvis returned to the home of Judge Sterling. He was awaiting them in a much calmer state of mind than he had displayed the night before. The city had grown very quiet before the moonbeams began to enter the chamber where they held their nightly concert. A few late stragglers were on the streets and an occasional taxicab broke the silence with a subdued blast of its horn. But whatever else might have been irregular on this night, the moonbeams kept their tryst. They stole into the judge's room and began their ghostly melody just as per schedule. Doctor Jarvis kept every sense alert, seeking to penetrate the magic of this singing.

Now, when the concert was nearly over, the judge listening with unabated intensity to the words of the singer, something occurred which sent Doctor Jarvis bounding from his seat as if a spring had suddenly thrown him in the air. And for the next few seconds, until the last words of "Annie Laurie" had been sung, he sat on his chair, much like the proverbial hen on the hot griddle. The singer had paused, as if for breath, between the words "for" and "Annie Laurie" near the end of the song, precisely as it had done the night before.

"Come along, Inspector," he said, "we've heard enough. Judge," he continued, turning to Judge Sterling, "just listen to those moonbeams alone to-morrow night. And don't take them too seriously. That is, don't believe it is supernatural in any way. You will hear from the inspector and myself in a few days."

With this enigmatic statement, Doctor Jarvis fairly pushed the inspector out the front door.

"Inspector," he said, when he had seated himself in the inspector's car, "did you, in your reading, ever run across King Henry III.?"

"No," replied Inspector Craven, acidly. "If you are solving the mystery of the singing moonbeams by reading King Henry III. of whatever country you have in mind, I'm willing to believe you're as crazy as the judge is getting to be. After a couple of nights with those moonbeams, I was beginning to get acquainted with them."

"Exactly, Inspector, and we were helping the judge to the same frame of mind. Except that, as he was deeply in love and his bereavement is recent, it was much more harassing to him. But, to return to King Henry, a French King, by the way. He has more to do with this mystery than you believe. One of the dear King's courtiers introduced him to the Lord. The King was awakened by a terrible voice, which called on him to repent. The voice announced that it was the voice of the Lord, and if King Henry did not obey, dreadful things would happen. As the King lay in his bed trembling, one of his favorites said, 'Sire, if this is God talking, he surely must have caught an awful cold.'

"In fact, the King listened again and the voice audibly sniffled. So they traced the voice to a tube over the bed through which a disgraced courtier was talking to the King. Unfortunately the courtier had a bad cold."

"It's a good story, Doc, but what's it got to do with the moonbeams?"

"Inspector, you're too good a detective not to have noticed that on two successive nights the moonbeams, while singing 'Annie Laurie,' hesitated at exactly the same point both nights."

"I saw you jump, that was all. I'm not Galli Curci. A song is a song to me. I'm no musician."

"Well, no human voice, no singer's voice, would break at exactly the same spot in a song every night, would it? Colds don't move in orbits like the moon. You cough ten times at once and then don't cough for hours."

"You win the coughing contest, Doc. What's the answer?"

"Well, we don't believe in spooks. The ghostly voice,

like King Henry's courtier, displays a mechanical defect. In other words, that music coming down the moonbeams is produced by a mechanism that has a flaw in it. In other words, it's just a trick, and to-night we're going to learn what kind of trick."

For all his confidence, Doctor Jarvis was puzzled. He spent his entire day with his magnificent scientific collection of books, but found nothing to help him. Then he called up his friend, Emery Holroyd, one of the most distinguished research men of the Universal Electric Company.

"Say, Emery," he demanded, "is there a way of sending sound, music, for instance, through space? I don't mean radio or wireless; I mean just a projection of music?"

"My glory, Jarvis," cried Holroyd, "you don't mean to say that with your harum-scarum amateur science you've picked up our latest discovery?"

"I don't know what discovery you're talking about, Emery, but if you can throw any light on the crazy experience I've had the last two nights you're a better man than I am, Gunga Din."

"Come on up to the laboratory, then, and I'll show you what we have."

Before many minutes had elapsed, Doctor Jarvis was in the laboratory of the company which was making extensive researches into the theories advanced by Milliken and other prominent scientists. Emery Holroyd, a tall, spare man, with stooped shoulders and keen, peering eyes, greeted him warmly and led him into his private sanctum, a room filled with all kinds of apparatus, X-ray tubes, containers of radium, of uranium, polonium, and many rare and radioactive substances. In that laboratory the emanations of many supposedly decomposing elements had been duplicated.

"Now, Doctor," said Holroyd, "you have in some manner stumbled onto one of our secrets. We don't know to what uses it may be put, but it does make possible the projection of sounds along a ray which may be focused on a distant point. How you know of it, I can't imagine, but there is one possibility. We discharged an assistant a few months ago because we learned that he had a criminal record, and some of the worst scoundrels in New York were dunning him for blackmail or hush-money. He was a foreigner named Chagres, who has had a fine scientific training. He assisted in the experiments that led to the discovery of how to project sounds as we do in radio, except that the sounds are focused on one point along a beam of light. And that may lead to one new development of radio, namely, the selection of the place to which we want to direct the program."

"That is interesting," said Doctor Jarvis. "Show me your machine and I'll get back to Inspector Craven, who is waiting for me with the greatest curiosity in the world."

DOCTOR JARVIS, instead of spending a half hour, as he had expected, remained at the laboratory with Emery Holroyd until late in the evening, leaving the inspector a sadly worried man. Naturally, he thought the doctor had become interested in Henry III. and forgotten all about the moonbeams. But the doctor, having gotten all the information he needed, called him on the telephone shortly before midnight.

"Inspector," he said, "how about picking me up at the Universal lab. and we'll have a visit with the author of the singing moonbeams."

"Thank the Lord. I was beginning to fear you had taken up some literature about that simple minded King Henry III. He was no worse, though, than I feel about these darned moonbeams."

In a few minutes the inspector reached the laboratory. From there it was a short drive to Judge Sterling's house. Before reaching the house, the inspector parked his car in a garage. Then, as quietly as possible, the two men went on foot to the scene of their previous nights' adventures. Doctor Jarvis calmly took the lead. He did not enlighten even the inspector as to what he hoped to discover.

They stole softly into the gate but avoided the great portals of the old mansion. Around the side of the stone steps they crept to the grounds in which the house stood. While there were many trees, the side of the grounds on which the judge's chamber faced was almost clear of either trees or shrubbery. Standing in the gloom beneath the bedroom window they saw across the lawn the outlines of another large house, adjoining the Sterling property.

"You remember that other house, Doc?" said the inspector. "That was the old Lasater home, but it's been unoccupied ever since old man Lasater died on his way back from Europe. The children preferred to live down on Long Island. It hasn't even been rented. But there's been talk of turning it into an apartment."

"It's a lot lower than the judge's house," said the doctor. "I believe when the moon rises it will shine directly over the front of the house into the judge's bedroom. Let's have a look at the house anyway."

"Crossing the grounds of the Sterling property, Doctor Jarvis and the inspector found themselves at a stone wall which separated the two properties.

"Inspector," whispered the doctor, "we've got to get over that wall with the least possible noise. We don't want to alarm anyone. The moonbeams will soon be on the job."

"I'd look fine if one of my own men took a shot at me," said the inspector, grimly, "and if he missed me, I'd have a fine time explaining that I was climbing a wall between two respectable houses in search of moonbeams."

"Think of Columbus; he took a chance," whispered the doctor.

"I'm thinking of King Henry III.," retorted the inspector.

"Damn!" exclaimed the doctor, who had drawn himself up to inspect the wall, "they've got spikes atop this wall."

"Here, I'll lend you a back," said the inspector, stooping. "Then you can help me up. I want to get this over with."

Doctor Jarvis stepped on the inspector's back and contrived to get on the wall, which was quite broad. The spikes were far enough apart for his feet, though his clothing was damaged before he got settled. Leaning down, he caught the inspector's hands, and after much straining on both sides, the two men were standing on the top of the wall.

"It's dark as the inside of a cow down there," said the doctor. "I hope there's no dog."

"You can think of the most comical things," muttered the inspector.

Not knowing what was at the foot of the wall, the two adventurers let themselves very gingerly down into the garden surrounding the Lasater house. They dropped into soft sod though their clothing suffered more from sliding down the wall than it had in their climbing up. Walking a few steps, they felt themselves on a cement walk and, nearing the house, came on heaps of dried mortar and other rubbish.

"You're right, Inspector. Workmen have been at some kind of repairs here, but that happened some time ago. The mortar is all dried."

"If I knew what I was doing, I'd feel more contented," said the inspector. "But I've gone this far, I may as well see it through to the end."

"Think of the surprise you'll have," whispered the doctor.

"I've had one already. I've ruined a good suit of clothes, climbing over a spiked wall in the dark."

"What's this?" whispered Doctor Jarvis, as his hand encountered an iron bar.

"You may be a scientist, but you don't know a fire-escape when you run against it," whispered the inspector. "They've been altering the old place into an apartment and the fire-escape has been stuck on this side of the wall. Darn it, Jarvis," he continued, "some of the tenants may have moved in already. Better be sure what we're doing. I'd much prefer the front door to this business. We might just as well be burglars now."

"Look, Inspector," replied the doctor, "the moon is rising. We'll soon see it shining around the corner of the roof."

THE Inspector looked up. The first rays were filtering over the front of the Lasater house, then bending in a long brilliant shaft toward the chamber in which they knew Judge Sterling was awaiting the message of those mysterious beams. Inspector Craven felt much like a treasure seeker who has neared the end of the rainbow.

The moments grew tense as the moonbeams made their slow and constant way toward the judge's bedroom. Although it seemed an eternity of waiting, Doctor Jarvis and Inspector Craven watched with every nerve alert for the first strains of the moonbeams' concert. But as the flood of light entered the judge's chamber they heard none of the sounds that had so mystified them. Suddenly Doctor Jarvis started.

"Gosh, Inspector," he whispered, "look at that!"

He pointed toward the second window on the top, the third floor, of the house, above which they were standing. The inspector looked and, to his amazement, saw a pencil of light projecting from this window toward the judge's chamber and mingling with the moonlight as it entered the room.

"Some one in this house is shooting a beam of light into the judge's room. Let's go up and see what it's for," said Doctor Jarvis.

"The devil," said the inspector, "there's something crooked in this. The doors may be barred or guarded. The fire-escape's our only chance."

The lowest platform of the fire-escape was very little above the level of their heads. With the inspector's help, Doctor Jarvis gained the platform and assisted the inspector to the same position.

"Got your gun, Inspector?" asked the doctor.

"No," said the inspector, "I didn't think a gun would be any use against a lot of moonbeams. And I guess you haven't one either."

"No, but I've an idea this is our last chance to solve the mystery of the moonbeams. I don't know how many people are in on this, but that's our misfortune."

"Well," said the inspector, "we'll see it through. If they get hard, we'll have to get hard too. Let's go."

Noiselessly, one step at a time, at every instant pausing to note any signs of alarm, the two men mounted the steps to the second platform. There, a slight musical murmur became audible. More slowly still, they reached the platform of the third floor. The ladder brought them before a window toward the rear of the house. Through this window they could see the staircase leading from the second to the third floor. They crept toward the next window which opened into a large room. Instantly the figure of Inspector Craven stiffened. Doctor Jarvis was equally astonished. Peeping cautiously into the room they could see the figures of three men about some apparatus at the window adjoining, at one side of which a light was shining.

These men were bent over with their backs to Doctor Jarvis and the inspector. But even with the window closed both of them could now catch, faintly, the strains of the first stanza of "The Rosary." The doctor nudged the inspector, who motioned him to withdraw. They retreated from the window into which they had been peering to the far end of the fire-escape platform, where there was also a window.

"Doc," said the inspector, "you're right. The two birds nearest us, with their bullet heads and general carriage, carry the mark of the pen, sure enough. They're bad eggs, though I couldn't see their faces. The other chap is with them and must be the same kind of a bird. That makes it three against two."

"We can't back out now. Besides, they don't know we're here and we do know they're there. How'll we get at them?"

"This window is in the room back of the one they're in. That music will help us some. If only this window isn't locked."

Being a third story window, it was not locked. After getting it started Inspector Craven gave it one small push at a time and when it was half way opened, they could hear the music more plainly.

"Now's our chance, Doc," said the inspector. One after the other they crawled softly into the room. It was now possible to hear the men talking in low tones.

"That guy's nerve is gone," one of the men said. "The judge can't stand any more moonbeams. Betcha he'll be out of there in two days."

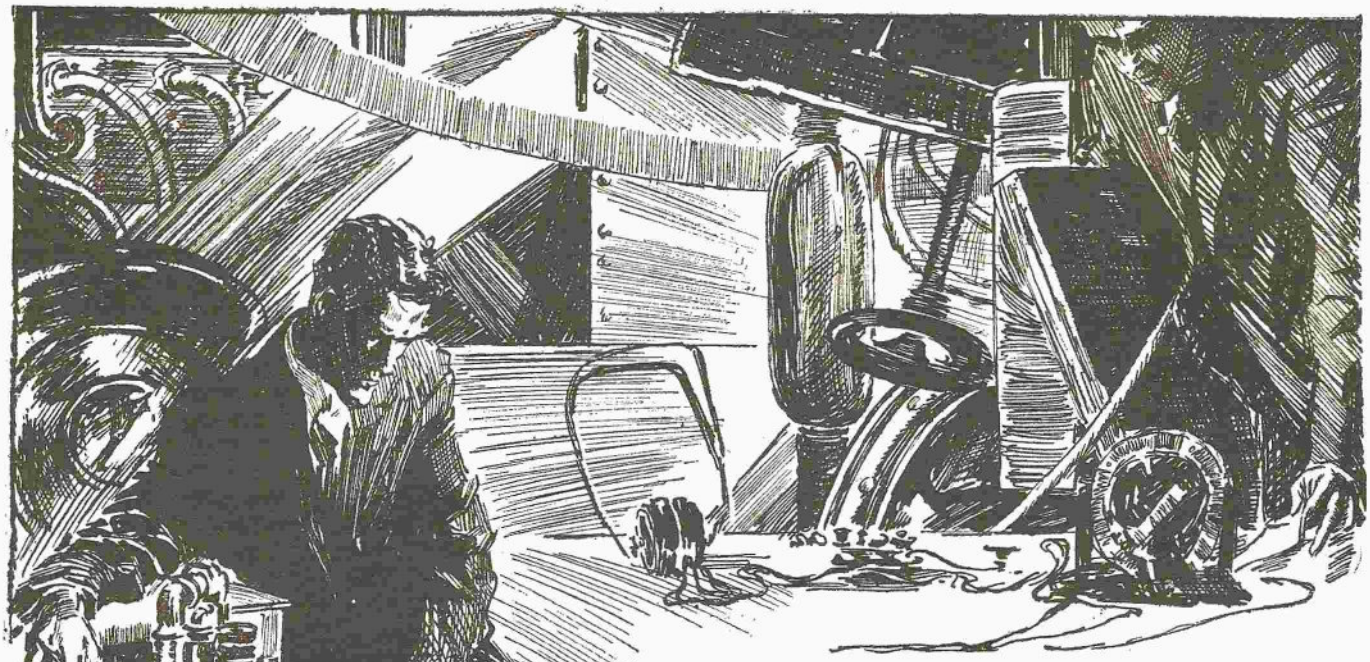
"He better be," replied another, "or he'll be out o' luck."

While they conversed, Inspector Craven and the doctor crossed the room into which they had crawled, entered the hall and went to the door of the room where the three men were at work. They might have come safely to the side of the men had not Doctor Jarvis, who was following the inspector, caught the toe of his shoe in the door sill, making a noise that sounded like a pistol shot.

But as the men turned like a flash, scenting danger, the doctor and the inspector were too close to them for gun play. The tall man who stood nearest their strange apparatus drew back his fist, but the inspector drove out with his right arm, striking the man under the point of the jaw and he was out of the fight for good.

IN this slight interval the man nearest the inspector launched a blow which would have stopped a less formidable man than the inspector and did indeed drive his head back. But he closed with this man who was a heavy-set, tough customer, his arms, working like pistons, hammering the man in body and face without yielding an inch. There was no science, just terrific pounding. The man gave as good as he got. He pounded the inspector in the eyes and the nose. Both men breathed hard from the terrible pounding. Then, as the inspector delivered a mighty blow that almost knocked the man out, he clinched, wrapped his legs about the inspector and they went to the floor with a crash that shook the house.

Doctor Jarvis had closed immediately with the third of the trio, who proved to be just as tough as the inspector's opponent and just as willing a fighter. For a moment the man had no thought of his gun. But he seemed to take a wicked delight in returning the doctor's blows to the face, marking his fine intellectual countenance and almost closing his left eye. As the doctor staggered back under the last blow, with a lightning-like movement the man half drew his automatic. But this was the movement the doctor had been watching for more than for any other, and before the pistol was fully out, he had the chap's hand in a vise-like grip. With his right hand he drove a terrific punch under the heart that made the fellow gasp. Following up his advantage, the doctor grabbed the hand which held the revolver and gave it such a wrench, bending the hand downward at the wrist, that with a slight groan the man relaxed his hold and the pistol fell to the floor. A couple of left punches on the



The inspector watched him curiously as the doctor moved an arm attachment to the apparatus and stopped the strains of music.

face sent the doctor back a trifle and the man sprang for the weapon, which had fallen some feet away. As he started for the gun, Doctor Jarvis made a flying tackle that caught the man about a foot below the waist, and they both went down with the doctor on top. His entire one hundred and eighty pounds had been launched at the man with an awful momentum, and as the back of his head struck the floor, the man lay unconscious.

By this time the inspector had beaten his opponent frightfully and was placing handcuffs on his wrists. Doctor Jarvis had picked himself up and retrieved the gunman's weapon from the floor.

"Doc," said the inspector, in a hoarse whisper, "they must have a lookout downstairs. I hear footsteps. I'll take care of these birds. You get the fellow coming upstairs."

The doctor reached the door just as the man was about to enter the room. As a burly figure dashed to the door, attracted by the noise of the struggle, Doctor Jarvis struck his wrist with the butt of his revolver and the gun fell from the man's hand. Then before there was time to realize what it was all about, Doctor Jarvis caught him about the waist and flung him over the stair rail.

Grabbing the man's revolver, the doctor went down the stairs and struck a match. The light shone on a villainous face. The man was cursing and groaning at a great rate and he complimented the doctor with the most fearful oaths the doctor had ever heard. Covering him with the revolver, the doctor searched him but found no other weapons.

"Where does it hurt you, my man?" asked Doctor Jarvis. "I'm a doctor and can help you."

"Y' kin, kin y'," the man snarled. "I know me hip's broken. So, y' kin keep y'r lip t' yerself."

AFTER assuring himself that the man's hip really was broken, Doctor Jarvis mounted the stairs to the room where he had left the inspector. By the light of the apparatus, which fortunately had escaped the general destruction, Doctor Jarvis looked at the inspector and almost broke into a laugh.

"For the love of Pete, Inspector," he said, "you look as if you had run into a steam roller. Two lovely shiners, and you're simply weltering in gore. Your nose is a sight."

"Well, Doc, if you think you look pretty, you better get a looking glass. You got a bulge on your jaw and one of your eyes is a candidate for a shanty. But we're lucky to get off as easy as we did. I've got these three beauties braceleted together. What did you do to that lookout chap?"

"Tossed him down the stairs and broke his hip."

"Now then, Doc, who do you think our friends here are?"

"About the ugliest looking creatures I ever saw."

"Well, they're pretty to me. We've got Tin Ear Commargo, and Gunner Stichlin, two of the ringleaders of the Borglum Trust Company robbery. If that other chap is Big Boy Lannery, we've got the whole crowd. They're the only ones that escaped. Wait till I see."

"Doc," he said on his return, "you've made it possible to round up three men who've escaped our traps and defied our strong-arm men for months. If you hadn't insisted, I never would have come up here to investigate those moonbeams. Now how the dickens are we going to call my men? I'd hate to leave either of us here alone with this gang. I won't feel comfortable until I get them put safely away. And there's no telephone in this house."

"Oh, that's simple enough," said the doctor. "We'll just ask the judge to telephone your men. Is dear old, reliable Clancy on the job?"

"Yes, but even if you shouted at the top of your voice and woke up the neighborhood, I doubt whether the judge would understand you at this distance."

"But you forget the moonbeams are still shining?"

"Excuse my curiosity, Doc," said the inspector, acidly, feeling his bruised and swollen lips, "are you going to disguise yourself as a toy balloon and slide down the moonbeams to the judge's room? And about all those moonbeams have been taught to sing are 'The Rosary' and 'Annie Laurie.'"

"We'll simply have to widen their repertoire," said the doctor, going to the apparatus left by the men on the floor.

The inspector watched him curiously as the doctor moved an arm attached to the apparatus and stopped the strains of "Annie Laurie," which were almost concluded. To this arm was attached an instrument that resembled a microphone. When Doctor Jarvis had set this microphone, he began to speak in that half jocular, half whimsical tone that never failed to irritate the inspector.

"Judge Sterling," he said into the microphone, "don't jump. This is Doctor Jarvis speaking over the moonbeams. Inspector Craven and I are in the old Lasater house, next to yours. We have had a considerable scrap with four very tough-looking birds, as the inspector so uncouthly calls them. We dare not leave them unguarded and one of them has a broken hip. Now, will you just go to your telephone and call Clancy at headquarters and tell him to send a riot car and an ambulance. You might also tell Clancy that Inspector Craven has a very pretty pair of black eyes. Good-bye, Judge Sterling. Station moonbeams signing off forever, you may rest assured, Judge Sterling."

"Oh, Lord, what hocus-pocus is this?" groaned the inspector.

But in about fifteen minutes they heard a pounding on the door, then a terrific crash as it was burst open. Clancy and his men swarmed up the stairs and halted as they found the groaning Lannery. Clancy sent him under guard to the ambulance. Then he took his men up the remaining flight of stairs until he found the inspector and the doctor guarding their prisoners.

"Mither of Moses, Inspecthor," said Clancy, "whatever has happened to yez. Ye look as if ye'd gone ten rounds with Dempsey."

"Never mind the compliments, Clancy," said the inspector. "Lock these birds up and throw away the key. Don't take any chances with them. Come on back to headquarters, Doc. I'll need some first aid soon."

By the time they had reached headquarters, both the inspector and Doctor Jarvis began to feel their bruises and other injuries more keenly. Their clothing was almost in tatters. After a shower Doctor Jarvis dressed their injuries and as it was daylight, the doctor sent to his home for clothing, while he and the inspector retired for some needed rest. They did not awaken until noon.

WHEN Doctor Jarvis had clothed himself, he went to the inspector's office to find that indomitable official at his desk. Reporters had already gotten the story and the early editions were full of the inspector's daring exploit.

"Say, Doc," he said, "why do you suppose those bums were entertaining the judge with a concert every night? The boys gave them the third degree this morning, but they didn't spill a thing."

"Do you remember when we came into the room in that Lasater house they said they were trying to get the judge out of his house. Now if you can think of any reason why they should want to get rid of the judge, you ought to find your clue."

"Holy Smoke, you've hit it. They wanted him out of the way so they could search the house. Now what would they search for? Doc, two of the gang's to be tried next week. They need dough. The Borglum Trust loot never was located. I'll bet anything, though I can't imagine how it was done, that dough's hidden in the judge's house. Let's go up there."

Judge Sterling was a changed man when they reached his house. All his lugubrious air was gone and he was as cheerful as he could be so recently after his great loss.

"I have to thank you gentlemen for the very valuable service you have done me, although I must confess that when Doctor Jarvis addressed me last night out of the moonbeams I almost jumped out of my chair. But you're all cut up. You must have had an awful encounter. Tell me about it."

"No, not yet, Judge," interrupted the inspector. "If you get the doctor on a scientific tangent, he'll be wound up for the day. The men who were giving you those concerts were the remainder of the Borglum Trust bandits. We overheard them say they wanted to get you out of this house. Now, I figure there must be a reason. Personally I believe they might have hidden some of the loot here. Can you see that as a possibility?"

"Wait a minute. This house was vacant. I remember seeing the accounts of the Borglum Trust robbery the day Norah and I arrived from Europe. Now, this house being vacant and in an exclusive neighborhood, they might have thought it a safe hiding place for a time. But my sudden purchase of the house and immediate preparations for alterations may have upset their plans. But where could anything be hidden?"

"From the way they acted, I'd suppose," said the inspector, "that the loot must be hidden in your bedroom or near it. Let's search it."

As soon as they had reached the chamber which had been the starting point of so many exciting events, the inspector began a minute examination of the walls, the fireplace, the panels of the woodwork, the floors—in fact everything. But they discovered nothing. Doctor Jarvis, sitting calmly in one of the judge's chairs, smoking his meerschaum pipe, irritated him beyond endurance.

"Doc, for the love of Mike, can't you suggest something? Why don't you look around?"

"I can see more from here than by steaming all over the room," retorted the doctor. "By the way, if the bandits got so much loot, it would make a pretty big bundle, wouldn't it?"

"Yes, but big or little, we've got to find it."

"Well, what would you say? The size of a suit case?"

"A suit case would hold a lot of money in big denominations, which the Borglum money was."

"Your pardon, Judge," said the doctor, turning to their host, "that's a handsome fireplace you have there. It must have been here when you bought the house."

"Yes, indeed, Doctor, Norah fell in love with the old thing and wouldn't have had it touched for the world. It wasn't even repaired."

"Inspector," said Doctor Jarvis, "I'll bet you even money you'll find something under the hearth of that fireplace. It's been repainted and the judge has just said he never had it repaired."

For a second the doctor's calm words left the inspector speechless. Then he was all energy.

"Judge," he said, "can you have a chisel and mallet brought here without attracting attention? It wouldn't do to have anyone suspect we were hunting a million dollars in your bedroom."

"There are plenty of tools in the garage, but I warn you I couldn't hit a chisel with a mallet, whatever the reward."

"If you furnish the tools, Judge Sterling, I'll do the hammering. Doctor Jarvis here, will no doubt be glad to superintend the job," he added sarcastically as the doctor crossed his legs and leaned back in his chair, puffing away luxuriously.

The inspector attacked the hearth with great vigor and soon had a considerable breach in the tiles. The doctor rose from his chair and after examining the wall with minute attention, resumed his seat and finished reloading his pipe just as the inspector finished demolishing the hearth, revealing a large opening in which were two fair sized suitcases. Opening one of these, the inspector verified that it contained notes of large denominations. Finding the number of the Borglum Trust Company, he called them on the telephone.

"Hello," he said, "this is Inspector Craven. With the help of Doctor Jarvis and Judge Sterling I've recovered the money stolen in that hold-up. The bundles of money are labeled with the trust company's name. If you'll send a squad of guards to Judge Sterling's house and give them a receipt, they can take the money away. You'll have to pay for ripping up Judge Sterling's hearth."

"GENTLEMEN," said Judge Sterling, after the bankers and their guards had identified the contents of the suitcases and departed with the money, "doubtless the bank is glad to recover its money. But while your service to me is beyond repayment, I have been moving in a haze since last night. I can see that you have had a desperate encounter. I could not rest well until I have learned all about this adventure. It is almost dinner time and I have a fine Japanese cook. Won't you stay for dinner and tell me all about it?"

After a dinner that deserved all the compliments Judge Sterling had paid his Japanese cook, the judge suggested that they repair to his library where they could smoke and hear the solution of the moonbeams' riddle. But Doctor Jarvis said:

"If you want to understand how the moonbeams sang, you'll have to be where they sang. In your bedroom is the secret."

When they had seated themselves comfortably in the judge's bedroom, both the inspector and Judge Sterling waited eagerly for the doctor's explanation.

"Judge," he said, "I can see this affair now from start to finish, but you will have to supply some of the details. The men who used what afterward became your bedroom, as a hiding place for the money stolen from the trust company, were frightened to death when you bought the house. Workmen came in unexpectedly, they were harried by the police and, as the inspector suggested, they needed some of the hidden money to defend the members of the gang who were coming up for trial.

"They got hold of a crooked scientist discharged by the Universal Electric Company and used his talents. Their idea was to frighten you out of this house. How they learned of your family secrets—that you had removed the records of your wife's songs and that you had taken pains to prevent radio waves from entering your house, for instance, I don't know. But, obviously, they knew it. Now, no ordinary threats would force a judge of the Supreme Court to leave his home. But they figured that the constant reminder of a recent grief might have that effect. It was worth trying anyway. If her voice haunted you regularly in a manner difficult to explain, they figured the trick would be done. You would probably want to get away, for a time, at least, and that would enable them to get into your house either by force in the night, or on some legitimate pretext which they could easily manufacture.

"What would be harder to trace to its source than a sound that came regularly with the moon as it rose an hour later each night? And so they planned it. The man, who was discharged by the Universal Electric Company, had worked on a new discovery, not entirely new, but newly used in a novel apparatus. He understood that apparatus and put it at the service of his criminal friends. The idea is to use a beam of light to transmit sound waves. The actual theory was demonstrated by Alexander Graham Bell fifty years ago. But there it ended until recently.

"With the proper apparatus, it is possible to focus a ray of light on a distant point across the street, across considerable space. And to send the human voice, a song, a musical composition, along this focused beam of light; in fact the striking of a match at the source of the beam could be distinctly heard where the beam struck. Now, if you, Judge Sterling, had seen a thin ray of light coming into your room, it would have provoked investigation even if it did produce music. But that ray of light blended with bright moonlight, and coming an hour later each night, accompanying the moonbeams, carried a mystery that was almost insoluble, inasmuch as the new discovery of what is known as 'narrowcasting' had not yet been announced. And the plot almost succeeded.

"Here is how they worked the scheme. In the house adjoining they rigged up two phonograph records of your wife's voice, 'The Rosary' and 'Annie Laurie.' By means of an electrical pick-up the music recorded on the disc is transformed into an electrical current which is led to a mirror one thousandth of an inch square delicately suspended in a magnetic field by means of wires. The light of an ordinary automobile headlight lamp is focused on the tiny mirror. The mirror quivering in tune with the electrical current focuses the light to a lens through which the beam, pulsating at the frequency determined by the music on the record, is projected to a target focusing mirror or to a lens.

"In other words, Judge Sterling, the target lens is somewhere in your apartment, and how they got it there you may be able to say. I cannot. At the point of the lens in your room here, another transformation takes place. The light sent across from the vacant house to this room with the moonbeams must be converted into sound. The lens in this room focuses the light on a photo-electric cell, which is merely a vacuum tube lined with a thin film of metallic potassium. This transforms the light back into an electric current. This current is amplified and sent to a loud speaker where it is transformed into sound. In radio the sound goes in all directions. In this process of 'narrowcasting' the sound or music follows the beam of light and goes nowhere else.

"Now, while the inspector was digging for the treasure, I went over the wall and in the line of inlay I located the lens. Here it is."

The inspector whistled when he saw that one of the medallions in the paneling which had appeared merely unusually bright was really a small lens.

"Can you recall anyone, Judge Sterling," asked the doctor, "entering the house who might have set up such an apparatus in the wall? Because the apparatus is undoubtedly let into the wall of your room."

"Since you mentioned the Universal Electric's assistant who was discharged for his criminal associations, I remember that, when I had the radio removed from the house, I received a letter on the Universal Electric's stationery in which the writer offered to insulate my

house so that no radio waves would be likely to annoy me. When Norah died, the sob sisters of the newspapers interviewed me and I probably let drop some of my emotion and reluctance to hear Norah's songs. But I did give this man a job, and he cut into the wall a bit, but I never thought much about it, after the radio was taken out."

"Well, Judge Sterling," said Doctor Jarvis, rising, "there the mystery ends. I suppose you will resume your seat on the bench in the near future and I should restore the radio, if I were you. Perhaps it would be less morbid not to avoid hearing Mrs. Sterling's songs, either by radio or phonograph."

"I thought of that, but I certainly never could bear to hear either the 'Rosary' or 'Annie Laurie,' voluntarily, at any rate, again. Good night, gentlemen, and many thanks."

THE END

Venus Liberated

By Harl Vincent

(*Continued from page* 359)

"They're off to Coris," he said as he spread the front page of the daily paper and sank down at her side beneath the sunshade.

In letters two inches high there was the headline, THREE SORENSON CRAFT START FOR VENUS, and underneath were photographs of the three spherical vessels as they took off from the landing field which had been provided for the new craft at the factory. There were photographs of the Corisian committee of four and of Sorenson, as well as one of Teddy and his bride. The face of Mary beamed from the page, as if attempting to give them a personal message of love and happiness.

Eagerly they perused the full page of details, and softly they voiced their amazement, as they read that Sorenson himself had embarked on this voyage. The list of passengers on the Comet was an impressive one and included, besides Teddy and Mary and Mrs. Timken, many of the great scientists of the day and several officials of the United States government. Veiled statements hinted of treaties to be made with Thalia and of plans for the development of the resources of Venus that would be of immense advantage to the inhabitants of both planets. The two new vessels, which had not as yet been christened, were manned by workmen from the Sorenson factory, and piloted by specially trained men who would take their orders from Teddy by radio during the journey. An entire column was devoted to Ralph and to his leadership of the activities which resulted in the eventual annihilation of Kellos and its fearsome inhabitants. This was a resumé of the original story written for the *Blade* by Mary, and it brought expressions of disgust from Ralph while it afforded great delight to Margaret.

"But you were wonderful, dear," she stated, when he voiced his indignation, "and I shall always be proud of what you did."

"Fiddlesticks!" he exclaimed. "It was no more than the others did, and no more than anyone in my position would have done."

But Margaret adored him with her eyes as he folded the sunshade and stretched lazily in the sand, gazing dreamily into the blue depths of the heavens where he knew the Comet and its two sister ships had vanished.

"Wish you were with them?" asked Margaret wistfully.

"Indeed not!" said her husband. "With you by my side I can ask for no more. Some day, though, we might make another voyage into space. Perhaps to some other planet. Whatever you wish will be my law."

He smiled and stretched himself in the sheer joy of living, as Margaret playfully tucked a handful of sand into the neck of his bathing suit. He made no effort to remove it.

"Happy, dear?" she asked, after a moment.

"And how!" was the enthusiastic reply.

THE END

White Collars

By David H. Keller, M.D.

(*Continued from page* 385)

and Larry, excited and dominant, told her, in no uncertain language, that he had brought her there to marry him, and that they were going to live happily ever after in that apartment. He went on to explain that she was going to do the cooking and washing and housekeeping and, while he had many time-saving electrical appliances, still, there would be enough to keep her busy.

Meantime, the older people waited anxiously in the background. They did not have the least idea of how it was all going to end.

Angelica Reiswick rushed through the apartment, ostensibly to escape, but not a detail of the furnishings was unobserved by her eyes. When she saw the kitchenette, with the electrical stove and shining pots and pans and White House Cookbook, and rows and rows of every possible kind of canned goods, she sighed a little and walked slowly back to the parlor where her lover and the preacher waited.

"I never heard of an International Lawyer marrying a plumber," she declared indignantly.

"What are you going to do about it?" asked Larry.

"I do not know. Such a situation was never mentioned in my four-year law course."

"In that case, let's marry," said Larry.

"Marry Larry?" she asked.

"Whom else?" he replied.

And really, what else could the last White Collar in America do?

THE END

Doctor O'Glee's Experiments

By T. Proctor Hall

(*Continued from page* 417)

point distinctly and strongly in the direction of hope for the mentally afflicted.

"Musical sounds—air waves—have at times a strong effect on the emotions. Dr. O'Glee has shown that the effect of ether waves is still more powerful, so much so that the mob that set out to kill was scattered in a few minutes by an intense wave of fear from the doctor's machine. It is rumored that the doctor's acquittal from the trumped-up charge of abduction was secured by ether waves. Beyond the fact that considerable hilarity was evident in the courtroom after the verdict was given, there is not a shadow of evidence that ether waves had, or could possibly have had, anything to do with it. The hilarity might have been produced with the aid of a machine; but there is not the slightest evidence that any ether waves have the power of directing a logical train of thought, or of controlling the judgment.

"Is it possible that the new application of these forces may do harm as well as good? Undoubtedly. Sunlight, the source of all terrestrial life, may cause destruction and death. Nowhere more than in handling the finer forces of nature is the highest skill required.

"Sunshine has been used for ages in the cure of disease; and sunshine is only a very narrow range of ether waves. Now that the fuller range of ether waves is coming under control, we may surely expect to obtain a large increase of power over misfortune and disease."

THE END

Your Viewpoint

Some Mathematical Views on the Effect of the Earth's Motion on Bodies Leaving Its Surface

Editor, AMAZING STORIES QUARTERLY:

"The Beast-Men of Ceres," which appeared in the Winter edition of the Quarterly was a story worth reading. The science was excellent. All of the astronomical constants appeared to be correct and, with the exception of a few minor details, it was scientifically perfect. We must realize, in judging a story, that composing a tale which involves many mathematical constants is no mean job. The author must be sure of his authority for the figures as well as be quite adept at calculating himself. So have a little pity for the author of a mathematical story and don't bear too hard.

I have been indulging in a little argument with Mr. John W. Reeves, whose letter appeared first in *Your Viewpoint* for the Winter Edition. He states that after a body on the surface of the earth has exceeded the velocity of escape, due to the earth's rapid rotation, it would leave the earth, but as soon as the contact was severed, the earth's centrifugal field would no longer act. Why is it, then, under those circumstances that comets travel round the sun so nicely instead of plunging in head foremost?

I believe that if a body on the equator were traveling with a velocity equal to or greater than the parabolic velocity of the earth, it would leave the earth and *never return.* It is true that *if* the body leaves at a tangent the centrifugal field would have no effect. But the body does *not* leave in a tangent but a parabola and is therefore subject to the centrifugal "force." Kindly inform us which is correct in this most interesting question.

Sincerely yours,
Edwin M. MacLeod,
1347 Girard St., N. W.,
Washington, D. C.

[You are perfectly right in your statement to the effect that some liberty must be allowed to fictional writers, when they use science in their stories. It is analogous to what is termed poetic license. We have got to let the author have his own way. Yet we do watch for errors in calculations, in chemistry and in practically every other science in the stories submitted to us. It is a saying that it's a poor man who makes no blunders. As regards comets, they are a deep mystery. How it is that a celestial body can take a path through space which is an open curve and never closes, is one of the puzzles of astronomy. Yet that is exactly what comets do. The curve followed by a body leaving the earth, which body naturally would start off in a radial direction and at the same time would be carried around by the motion of the earth, would vary according to the velocity with which it would rise. If it maintained the tangential velocity, the curve would vary according to the velocity with which it rose. We do not understand where you get the parabolic velocity of the earth as a factor. It's quite a complicated question, and another feature of it is that as the body rises and increases its distance from the earth, it will lag behind it in its rotation, because the radius of its path would be longer and it would only have its original velocity. This shows what complications a scientific story can lead to.—Editor.]

A Charming Letter from a "Mere Girl"

Editor, AMAZING STORIES QUARTERLY:

May a mere girl write a letter to so weighty and scientific a magazine as AMAZING STORIES? Your bright and attractive cover caused me to poke my nose inside it—hesitantly, and not a little dubiously, I not being so terribly old or dusty or wrinkled as yet. At first I thought you had inadvertently set your cover design upside down, and that made me look a little further at it, and then I saw that the design was from a story called "Beast-Men of Ceres," by a man with a strange name, and I looked at the story. And I was lost, because it started off so well that I could not bring myself to lay the book down until it was finished. Our whole family—all *women,* I may say, too—read it, and pronounced it excellent, and my mother, or somebody, asked me if I thought there would be others like it, and how could *I* tell?

My boy friend and some of my girl friends too, read it, and I wonder how many friends it has made you here in Seattle.

I should never have expected to be able to *understand* anything written in so learned a vein, but the author raised my respect for my understanding by letting me comprehend every bit of it. It is written as if it were meant to be understood by everybody and withal is in so delightfully human and appealing a vein that I was simply delighted.

The characters entice me. Although I could have wished for a lot more about Therma Lawrence, I found myself insensibly loving her, as well as "the fascinating Adrienne," and others. And Zah Ello-ta is a terribly interesting fellow. Interesting and really lovable. And that great big giant Maltapa Tal-na! Isn't he a dandy? I want to go to Mars! Do you think we shall, real soon? Mr. Septama makes it look ridiculously easy.

I could write lots more but you have other things to do besides read my letters so I will merely wish you and your very interesting periodical success.

Marguerite Z. Robbins,
1021 Pine Street,
Seattle, Wash.

[We are delighted to get a letter from a "mere girl." We have received a number of such. For some reason or other these letters always praise our work. It is quite interesting to see how you have enjoyed the "Beast-Men of Ceres." It affects you very much as it affected the editors. But don't hope to go to Mars very soon. We wonder if there is any chance of its ever coming about, but our writers have made excellent use of the theme.—Editor.]

More About the Prospective Science Club, Which Seems to Be on the Way to Organization

Editor, AMAZING STORIES QUARTERLY:

I take great pleasure in reporting to you that motions toward forming a Science Club have been put in order. You may recall the letter of George Lasky in your March, 1929, issue of AMAZING STORIES, wherein he expresses the wish that those interested in this club correspond with him. I have done so, and have received his return letter, in which he mentions the fact that he has received many letters from readers.

I have written him again asking him to send me the names of these people, who have written to him, so that the correspondence may be stretched further. I have suggested to him that he act as agent for the New York Branch of this prospective Science Club and I will act in the same capacity for Chicago, until you see fit to take a hand in the matter and appoint persons better fitted for that sort of thing. One very notable suggestion was made by Mr. Lasky in his letter to me, to this effect. When the club had progressed far enough we could have a small paper printed and circulated among the members. Of course, to cover the cost a small fee would have to be charged and the circulation taken care of by subscription.

I have also suggested this to him. That he as acting agent for New York, look over his back numbers of AMAZING STORIES and QUARTERLY and write to all the readers in New York who have corresponded with AMAZING STORIES and who are interested in forming a Science Club. Mr. Gerson and I are going to do the same for Chicago.

I hope we will have volunteers from other cities, who will do the same for the readers in their city who are interested.

I second the appeal of Mr. Lasky in saying I wish all those interested in this club write to me whether from Chicago or elsewhere and Mr. Gerson seconds this.

Walter Dennis,
4653 Addison St.,
Chicago, Ill.
Sidney Gerson,
1552 N. Kedzie Blvd.,
Apt. 100,
Chicago, Ill.

Editorials from Our Readers

THIS being your publication, you, the reader, have certain ideas, not only about this publication, but about scientifiction as well. The editors believe that their mission is complete when they select and edit stories that go into the making of this magazine. On the other hand, they feel that you, the reader, have a more detached view of the magazine itself, and that very often your ideas as to the magazine, and as to scientifiction in general, are not only valuable, but are original and instructive as well. For that reason it has been decided to print the best letter—about 500 words—which can be used as an editorial, on the editorial page and to award a prize of $50.00 for any letter so printed.

The letters which do not win the Quarterly prize, but which still have merit, will be printed in the "Editorials from Our Readers" Department, newly created in this magazine.

Laudatory letters containing flattering remarks about the stories themselves, or of the magazine, are not acceptable for the editorial page. We want inspiring or educational letters, embodying material which can be used as an editorial along scientifiction themes.

Remember, it is the idea that counts. A great literary effort is not necessary, as the editors reserve the right to edit all letters received in order to make them more presentable for publication.

Remember, too, that anyone can enter this contest, and everyone has an equal chance to get on the editorial page of AMAZING STORIES QUARTERLY hereafter.

This contest will continue until further notice. Contest for each issue closes the 1st of the month preceding date of issue—viz.—contest closing date for the next issue is the 1st of September.

The Science of Color

SCIENCE has indeed made great strides in the ages that have passed, is doing gigantic things in our present age, and can cover the gamut of human longings, make their endeavors materialize, if the human interest walk with it.

Today we hear the hue and cry of modernism, madness in dress and manners, and conventionalities. What is it all about, anyway? Why, it is just the imprisoned soul crying out from its chrysalis of ignorance for freedom, for life, for light. Years upon years we have been imprisoned in a cocoon of ignorance, whose tiny threads of misconception, wrong premises, garbled half truths, have shut us in from a world of beauty and scientific truths.

Today the butterfly within its narrow house has come to life, and is struggling for freedom, for space in which to spread its glorious wings to the sunshine of a divine world created and nurtured for it alone.

Today it has opened the cocoon in an endeavor to see the light. The bright sun of scientific accomplishment shines invitingly, and slowly the butterfly is crawling out to sun itself on the branch of opportunity, there to spread its varicolored wings, ere it soars into the blue of "Dreams come true." Dreams from an existence through years of fettered coma, when mentally it was building for just this day of escape, and freedom. Shall we in any way tarnish the glory of those wings which promise to spread wide and to mount to realms yet unexplored?

One of the greatest influences of our age is color, and we are seeing it everywhere. It has always been here for us, as telegraphy, television, and telephone, but hidden in our cocoon of ignorance, we could not see. Now the sun, rising on a new era, flings out upon the sky all the glories of a thousand worlds for us to grasp, to enjoy, to live among.

The violet ray of the scientist has worked wonders, but today we are finding that just plain Old Sol can do more, if we will let him enter our homes through certain scientifically prepared window glass. Our manufacturers have sensed the effect of colors and the markets are flooded with a glorious variety of colored fabrics, giving us the opportunity to clothe ourselves in colors which speed up vitality, energy, and efficiency.

The comradeship between men and women is growing; they work side by side in the world, know its problems as a unit, are able to grasp them better than when they lived in a drab age of prejudice (as it were in a chrysalis of ignorance).

Let us not then be narrow, and afraid to emerge from our own chrysalis of ignorance into the sunlight of adventure, accomplishment, and happiness; neither let us rush madly forth ere our wings are strong, after the ages of prejudiced confinement to conventionalities. Rather let us linger a bit on the branch of opportunity, drinking in the splendor of our world, then spreading our wings let us soar forth to bigger things. With the knowledge that science has stored up for us through the ages, there is nothing too great, too difficult for our accomplishment in the today.

While we are doing this let us keep the color scheme ever before us. Let us see the blue and the purple and gold in all around us. The gray makes a splendid background, but outstanding are the life colors of success, of happiness, of worth.

Every scientist, every inventor, has dwelt in a world of color, else he could not have succeeded. If we could analyze the invention down to its conception, we would find that some definite color formed its basic inception.

Study color, live color and it will lead you into new fields of success.

Kairy Kraig,
1461 Plymouth Avenue,
San Francisco, California.

Imagination in Literature

SINCE the time of man's first appearance on Earth, imagination has been his pioneer blazing the pathway to progress. The fire that first became his servant when he rubbed two sticks together has, under the inspiration of a million years of imaginative genius, resulted in the open-hearth furnace that mothers the steel heart of industry. Inspired by the dream of power his imagination pictured, paleolithic man fashioned the first crude stone implements that made him master of all life and, step by step throughout the aeons, this same inner fire has confirmed his leadership among species, races and individuals. Only the fittest survive the terrific struggle for existence, and he who lacks the imagination to carry him beyond the things that are to the things that might become, is unfitted for a world of progress. Imagination is the touchstone of invention, the key to industry and the inspiration of art.

Scientifiction is imagination in literature and the Scientifiction of today is the Scientifact of to-morrow.. It is sometimes claimed that history is the most unimaginative field of literature, for it deals with the past and the past is recorded in facts not subject to change or progress. But what about the rise and fall of races and countries and leaders? Were not the deeds which marked their coming and their going all conceived within the imagination? It was imagination that sang the siren song which called to Columbus to cross the Atlantic and bring to light a new world. It was imagination that beckoned Hannibal across the Alps and Caesar across the Rubicon. Without imagination, Napoleon might have lived and died in Corsica and Americus Vespucci in Florence.

It is sometimes averred that mathematics is an exact science and leaves no place open for the imagination. It deals with quantities, but quantities without imagination would be limited to one dimensional space, while mathematics encompasses three and even four dimensions. It is often said that the fourth dimension can be comprehended only by the reason and cannot be imagined, but it is obvious that without the imagination the fourth dimension could never have been born.

Science deals with natural laws, but natural law *plus* imagination is building the science of to-morrow out of the puny efforts of today. Through imagination, a boy making pictures in the steam issuing from the spout of a kettle, girdled the continents with the rails of traffic and made neighbors across the oceans. The realization of the phantasies of the dreamer has made a traffic zone through the air and human speech is winged from mouth to ear through thousands of miles of ether.

There was an age when blood-letting was science and a round earth was fiction, but centuries of science and imagination have made the round Earth a fact and blood-letting a superstitious folly. This scientifiction of which we write; this playground of the imagination between the Scylla and Charybdis of uncharted seas; this searching through the length and breadth of the land that might be, for the hidden paths that lead upward toward the mountain peaks; this flying kites in the hope that some may rise to realms that will transmit a thrill to him who holds the earthly end of the string; this then is the literature of the age to be, and affords a generous sanction for the hours spent by him who reads to learn and learns to live.

Frederick Arthur Hodge,
Pittsburgh, Penna.

Scientifiction as a Stimulus to Future Invention

SCIENTIFIC imagination, or more specifically scientifiction, will, without a doubt be one of the greatest of stimuli to invention in the very near future. In fact, it is playing its part in the present age. To more clearly understand this situation, an explanation of what invention is, its causes and effects and its connection with scientifiction, will be helpful.

To begin with, invention is a forerunner of civilization. With it, the wheels of progress are made to turn more swiftly; without it they would soon slow down and man would eventually return to the savage state.

There might be several definitions for invention, but generally it is the discovery or creation of something new, whether it be a new chemical, a new mechanical principle or just a new hook-up for the radio. Of course, the word "creation" is used in the smaller sense, there being only one Creator.

There are many causes for invention, but the most important ones are: necessity, experimentation and accident. Imagination has always played its part as a cause, but I will take that later.

Necessity has been quoted as being the mother of invention. Obviously it is the prime cause. When the world was young,

self-preservation was the first necessity; later, as the world became more civilized, comfort and the desire to save time and human energy became the greatest causes for invention. In this age of wonderful machines, highly scientific minds and ultra-modern luxury, imagination and especially that of a scientific nature is fast becoming a prime cause.

Now as to the effects of invention: most of them are quite obvious. Briefly, invention has brought the world closer together, materially as well as spiritually. It is responsible for the social and industrial advancement of the principal nations. The success of exploration both past and present has depended directly upon scientific inventions, and the success of future exploration will depend upon the same and on other future scientific inventions.

Now we come to the connection of scientific imagination or scientifiction with invention. As I said before, I believe imagination is one of the principal causes for invention, more so now than ever before. Of course, scientific inventions will do the most good in future ages. Naturally, the greatest help and stimulus will come through scientific imagination. *Scientifiction* is just another word for stories based on scientific imagination.

Therefore, in conclusion I might say that *Scientifiction* will play an extremely important part in stimulating and inspiring the discoveries and inventions of future generations.

George R. Godfrey,
922¾ Maltman Ave.,
Los Angeles, Calif.

Scientifiction and Progress

DURING the ages of man's endeavor upon earth he has progressed greatly. Slowly but surely with steadily gathering momentum he has surged up toward the inevitable goal, the goal of which even the most farsighted among us can never know anything. Today we are progressing at almost breath-taking speed. Nearly every day new vistas of the future are opened for our wondering eyes. Not satisfied with even that, we have recourse in this advanced age to scientifiction. Scientifiction is at last coming into its own, and it has now convinced many of its real value. True, there are still millions of skeptics, but their number grows less with the passing of the years. Time after time scientifiction has shown to a skeptical world its powers. Swift foresaw the moons of Mars, and Verne the submarines and airplanes of modern times. These are only prominent examples; there are hundreds more. What will the future be like? Go to scientifiction and it will tell you as well as man can. The successful business man gazes into the coming years. He develops his imagination and sees things as they will be. From this he draws his success. This may apply as well or even better to other lines of endeavor. From the time of the first humans until now man has used his imagination to a greater or lesser extent. The first beginnings of this were when the savage foresaw the coming winter and stored his food. As man's imagination increased, the advantages he reaped from it also multiplied. He began to think about a future war and prepare for it, he began to think more and more about training his children for future life, and he began to think about bettering the future condition of his people. Countless are the ways in which man has used his vision of the future to make the world a better place for himself. Today farsighted men, knowing what a war in the future would be like, are trying to create peace between the nations.

In the past, man has not given recognition to the helpful imagination, that he owns. Now, however, in this highly civilized era mankind is beginning to learn the truth about this great faculty. Scientifiction gives food for thought and stimulates the mind. With improved imagination comes greater progress. Progress we certainly want. Therefore the more scientifiction the better.

Today the world is several hundred per cent better than it once was. This is all due to progress; progress in science, religion and many other things; progress founded upon ambition and imagination. There is a limit to ambition as it is bad for it to go too far, but there is no limit to imagination. If we wish sooner to reach the goal which God has set for us, then let us develop our imagination. Besides helping the world, it helps us. Is it not imagination from which business men draw their success? Let us then help this new whiplash of civilization that is driving us to better things, this essence of new thought, scientifiction.

Duart Vinson Brown,
701 Lake Street,
Reno, Nevada.

Scientifiction as a Literary Medium

IT is often asserted that critics consider scientifiction *per se* to be unworthy of respect. The theory is that their minds have become so fixed through the constant reading of books always approximately the same, that the present impossibility of the plots of science fiction prejudices them against giving the stories their proper consideration. This is obviously wrong.

There are two grand divisions of written fiction; the "wood-pulp" magazines (including westerns, detective stories, war stories, etc.), and the more literary and critical group. With the former, critics have no official connection, for obvious reasons. The whole of their scanty comment upon periodicals is made regarding the latter, usually about those more-significant portions to be brought out in book form later. The immense number of publications precludes any other procedure.

At present scientifiction lies between these two groups, principally because of its writers. Those of smaller experience are more likely to attempt these tales. Their technique is yet too imperfect to permit them to aspire to the latter, nor have they yet standardized their output enough to become efficient wordage-machines for the former. Grasping at the idea of originality, they write pseudo-science, but their lack of skill betrays them into banal and trite false notes, which offend the critic's literary ear. He thereupon pronounces a curse upon the story, which his superficial auditors conceive applies to the plot as the most prominent part of it.

The fault, then, lies not in the story but in the handling of it. An original plot is an advantage, but not a necessity. Possibilities are so limited that the genius of the writer is the only index to the greatness of his work. Many of Shakespeare's plots were plagiarized, but none of the originals are half so valuable as his finished products. Hence the corollaries that proper treatment will render any plot acceptable, that a story should not be blamed for the scanty genius of its writer, and the converse (would that it were widely accepted!) that no one without genius should try to write at all.

The obvious answers to the charge of unfair discrimination may be quickly expressed. Great writers, delicate, work-loving, painstaking writers, are seldom born so. Whatever their themes, their stories are great. Though amazing stories average higher, due to the greater amount of intellect necessary to plot them, no story can be greater than its author. That the better modern writers seldom write them (due possibly to their knowledge of the faintness of the line dividing a pyramid of logical reasoning from a rubble pile of extravaganza) is to be deplored, but expected. If absurdities alone warranted condemnation, Sir James Barrie would never have been heard of. But he has proved that for the delicate plot the delicate touch is necessary. The theory is that no theme is intrinsically unsuitable for a great story, and our only resource is a hope that soon some transcendent genius will arise to prove it so far as it concerns scientifiction.

Joseph M. Wilson,
Gridley, Illinois.

The Mission of Scientifiction

UNTIL comparatively recently the progress of science has been advancing at what may be termed a snail's pace. Looking back about a century, it is not hard to see the cause of this. As an example, let us picture a scene in one of the small villages of England during the eighteenth century. A wonder of science has just been formed. The human voice has just been sent through a transmitter, across a thin wire, and has been distinctly heard by another party miles away. Marvel of marvels! Another vote for science.

But did the people of this community share this opinion? Not for a second! Their narrow-minded point of view was typical of that of the rest of the earth at that time.

"This man Bell is using black magic," said one; "it is a device of the divil."

"This is a community of God-fearing people," said another; "we will not allow our village to be desecrated by a product from the devil's workshop."

Such was the reception of this ingenious invention by these unprogressive people. No wonder a lack of progress in science. For what could be accomplished in the face of such a barrier? Why this backwardness, this unprogressive spirit on the part of the world? Why were the advances of science met with a balk when it most needed encouragement?

It was clearly to be seen that unless an antidote was administered, the advance of science would gradually decline into a serious state of stagnancy. Fortunately, a few men foresaw the disaster that would eventually occur. A young Frenchman by the name of Jules Verne held the view that what the world needed was something to make them take an interest in science and what the future held in store for it. Stimulation! That was it! Stories that gave readers food for thought. Stories that were based generally upon cold scientific facts, but which contained some theory and imagination of the author; a story which was both instructive to the reader and which gave him a broad outlook on the future for science.

Jules Verne was among the first men in the field. His story, "Twenty Thousand Leagues Under the Sea," predicting the advent of the submarine, set men to thinking, and not many years later the submarine became a reality. Verne's "Robur, the Conqueror," issued in 1886, in which the author foretells the coming of the airship, gave men food for thought, and brought about experiments which hastened the arrival of both the "lighter than air" and the "heavier than air" machines.

Other writers then began to enter the field. New ideas and theories were brought out in their works. The rise of science fiction has steadily increased until now it has more than accomplished its purpose.

Harry Northrop, Jr.,
624 10th Court, South,
Birmingham, Alabama.

[What you tell us is most interesting. We make a great point of our "Discussions Column" in AMAZING STORIES and of these corresponding columns in the QUARTERLY edition. It puts our readers in a position to correspond with each other and makes the formation of a readers' club very easy. The only point is that our readers will have to do the work. We are quite crowded here and feel that our magazines, the MONTHLY and QUARTERLY, must get the best that is in us, for what we are working for is our readers' appreciation. The point we wish to make is that our correspondents themselves must organize the club, recognizing that we are interested in it, and will in the future when it takes shape, be delighted to give its progress space in our columns. You seem to have struck the right note and we congratulate you both. —Editor.]

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUG. 24, 1912, of AMAZING STORIES QUARTERLY, published quarterly at New York, N. Y., for April 1, 1929.

State of New York, } ss.
County of New York, }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Gustav Gardner, who, having been duly sworn according to law, deposes and says that he is an Assistant Vice-President of Irving Trust Company, owner, as Trustee in Bankruptcy of the AMAZING STORIES QUARTERLY, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Irving Trust Company, as Trustee in Bankruptcy of Experimenter Publishing Company, Inc., 233 Broadway, New York City; Editor, Arthur J. Lynch, 230 Fifth Avenue, New York City; Managing Editor, none; Business Manager, B. A. Mackinnon, 230 Fifth Avenue, New York City.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) The owner is Irving Trust Company, of 233 Broadway, New York City, as Trustee in Bankruptcy of said Experimenter Publishing Company, Inc., said Irving Trust Company having been duly appointed Receiver in Bankruptcy on February 20, 1929, and Trustee on March 28, 1929.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

IRVING TRUST COMPANY,
By G. Gardner,
Assistant Vice-President.

Sworn to and subscribed before me this 2nd day of April, 1929.

(Seal)

Hiram Gans,
(My commission expires March 30, 1930.)

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