

Via the Time Accelerator

DINNER had just been finished, and for a while following the meal Brockhurst and I maintained a desultory conversation as we sat ensconced in the comfortable chairs of his living-room. My eye chanced to fall on a little book that lay on a nearby table.

"Wells' 'Time Machine,' eh?" I began, picking up the little volume and thumbing the pages. "So 'tis. Ever read it?"

I assured him I had, and after a brief discussion on the literary points of the story, our discourse turned to its practical possibilities.

"Looky here—what do you think of time-traveling? Consider it possible?" Brockhurst demanded.

My answer indicated that I had an open mind on the subject. "It's dangerous nowadays to employ the word 'impossible,'" I concluded. "So darn many 'impossible' things have become commonplace facts that the word hardly belongs in the vocabulary any longer. So I wouldn't say that time-traveling is impossible; but since my sentiments are conservative, I wouldn't say offhand that it is *possible* either. I prefer, at the present, to remain neutral with reference to that question."

"A commendable attitude," my companion lauded with a nod. "Very commendable. I suppose if someone *proved* to you that time-traveling is possible, you'd embrace the theory?"

"Absolutely! It would be silly to close one's eyes to a demonstrated fact."

"Sure thing. Now if I told you that time-traveling is possible, would you believe me?"

I did not reply at once; instead I surveyed my friend carefully from head to toe—sleek black hair, earnest, clean-shaven face with its twinkling blue eyes, and tall, well-knit body in its blue serge suit. Brockhurst was about thirty-eight or forty years old, unmarried, fairly well off, and an electrical engineer by profession.

"Hum—well—I'd believe you if you could *prove*

A GREAT many of us have found stories of the past intensely absorbing and instructive, but we doubt whether there are many who would not give a good deal to go ahead into the future many, many years—if their safety could be assured, of course. Einstein, with his generally un-understandable formulas and numerous theories so confusing even to eminent scientists, has apparently started those scientists who think they do know what it's all about planning or inventing some machine or something that will permit them to travel, in time, forward or backward, or perhaps both. It all seems remarkably simple and plausible after reading this story by our well-known author. This is one of the best fourth dimensional stories yet.

your assertion," I answered at last slowly. "But as long as you just say it's possible, I prefer to retain my present impartial attitude. Why—have you anything authentic to indicate that it is possible?"

Brockhurst laughed a little. "A lot of mathematics that you couldn't follow to save your soul, and—a time machine."

I caught my breath to stare at him—incredulously, I am afraid.

"A time machine?" I repeated at last with an interrogative inflection. "Whaddaya mean? Show me!"

"Step right this way, please!" was the obliging rejoinder, and rising from his chair, my host conducted me to the workshop at the rear of his house.

Why should I bother to describe the room? It looked just as one might expect an electrical

experimenter's laboratory to look—a large, stone-walled chamber filled with all manner of electric motors and appliances I did not recognize. Electricity isn't my line, you know.

At one end of the shop, before a great double door that was now closed, reposed a small cabin airplane, resting on a pair of staunch, rubber-tired wheels, between which I saw a compact array of electric machinery.

"Cast an appraising eye over the first time machine," invited Brockhurst with a magnanimous flourish, as we paused before the craft.

"Oh!" I exclaimed with a snicker, "I see. All you have to do is to climb into the trusty old crate, start the motor, and soar back and forth through time like a bird, huh?"

"Exactly!"

I looked at him quizzically.

"Evidently," he smiled at me with a merry twinkle in his eyes, "evidently you are a trifle nonplussed as to what my big idea is. Here you see before you a perfectly natural-looking monoplane, evidently constructed for the navigation of the third dimension; and here I

A Fourth Dimensional
Story by

Frank J.
Bridge

Author of "The Moon Men" and
"The Moon People"

Illustrated by
MOREY



¶ Ere I had taken a step, the floating plant whipped toward me upon its sinuous trunk, and of a sudden I was inextricably entangled in all its writhing, snake-like whiplashes . . .

am cracking a silly, pointless joke to the effect that it's a time machine. Hence you expect an explanation, and your expectations are fully justified. Let me, therefore, reiterate that this is a time machine. Want me to explain how it works?"

"Naturally—if you want to vindicate your purpose in dragging me out here!"

"Very well then." Brockhurst seated himself on a table close by, motioning me to take my place beside him. "I'll try to explain its rudiments as briefly as I can. First I'll have to give you a sketch of its principle, so that you may appreciate its operation. Do you know anything about Einstein's Relativity Theory?"

"A little," I confessed after a mementary pause. "Not much."

"Good! I suppose, then, that you know what a world-line is?"

I nodded, and to show him I meant it, answered aloud, "A world-line is a continuous succession of point-events in a four-dimensional space; or, in other words, it is the path pursued by any particular body through space and time. It is the body's trajectory, so to speak."

"That's the idea!" yelled Brockhurst, slapping me on the back. His enthusiasm was too great; I felt he was poking fun at me. "For instance," he went on, "if that body were not traveling through Space, its world-line would extend only into Time, or the Four Dimension, as some people call it. Now then, if we pick any particular point on that world-line—say the point $x_1' x_2' x_3' x_4'$ designated by the dimensions x, y, z , and t —it follows that the adjoining point on each side will be the direction of the Fourth Dimension from our selected world-point. That is, the one point— $x_1' x_2' x_3' x_4'$ —will be in the *future* of our designated point, while the other— $x_1 x_2 x_3 x_4$ —will be in the *past*. You understand?"

"Perfectly."

"All right. Now—here's where we get to the core of the matter: *Do you know that the Fourth Dimension need not necessarily be time?*"

I stared at him blankly.

"It makes no difference whether or not we regard the Fourth Dimension as time," Brockhurst went on after a moment. "To all practical purposes the Fourth Dimension and Time are identical. But—according to a certain scientist named Turner, the Fourth Dimension is *not* time, but a certain constant *multiplied* by time! And that constant is the velocity of light. Thus, if we let w represent the fourth dimension of space, we have:

$$w = ct,$$

where c is the velocity of light—186,000 miles per second—and t is any period of time we choose to work with.

"Since velocity is distance divided by time, we can make this equation a little more specific by writing it this way:

$$w = (l/t)t,$$

in which l is the unit of distance—186,000 miles—and t is the time required for light to cover that distance, or one second. From this we can see that every body travels 186,000 miles into the Fourth Dimension every second.

"Upon this assertion of Dr. Turner I based certain calculations of my own, which eventually culminated in this time machine here. I won't go into the details

right now, but, briefly, it occurred to me that those equations I just gave you were subject to relativity; that a particle's velocity through space must also influence its progress along the Fourth Dimension.

"Time as we know it is not universally absolute. The rate of its passage depends to a great extent upon the velocity of its observer with regard to some certain reference system. A moving clock will run slower with respect to a selected co-ordinate system than a stationary one. According to the Lorentz-Fitzgerald formula, the 'time' of either clock is

$$T = \frac{t}{\sqrt{1 - v^2/c^2}}$$

where t is the clock's rate when it is stationary, v is its velocity through space, and c is the velocity of light."

Brockhurst stopped in order to shift his position. Then he resumed.

"Let me give you an example. Imagine two asteroids in space, 161,000 miles apart. For the sake of simplicity we will assume they are stationary in space, at least in relation to each other. On one of these asteroids, which we will call A, we place two observers having watches which run at the same rate when at rest. One observer, O, has a space-flier capable of attaining enormous speeds. Now at a given instant, which is the same for both observers, O starts his space-flier and at the velocity of 161,000 miles per second flies from asteroid A to asteroid B. The second observer, S, remaining on A, watches and times the flight of his companion, remarking that exactly one second is required for O to make his trip from A to B. O, however, likewise times his trip, and *he* finds that only *half* a second was needed for the journey. The reason, of course is that his watch ran only half as fast as normally while he was flying through space from A to B.

"Now this idea, it occurred to me, must also apply to Turner's suggestion of the Fourth Dimension. If there is no absolute *time* in the world, there is no absolute gauge wherewith to measure our progress along the Fourth Dimension! The corrected equation then, becomes

$$w = (l/T)t,$$

t being the rate of time-passage to a stationary particle, and T being the rate of a moving particle. And T , of course, has the value expressed in the Lorentz Transformation equation which I gave you before. More specifically, therefore, the actual equation of a body's extension into the Fourth Dimension is

$$w = \left(l / \frac{t}{\sqrt{1 - v^2/c^2}} \right) t."$$

Again Brockhurst paused and took a deep breath before he plunged anew into his discourse.

"Do you see the implication? It is simply that there is *no absolute* rate of motion into the Fourth Dimension! Time, or more accurately, passage through the Fourth Dimension, as far as concerns any particular body, depends upon the velocity of that particle through space. If its velocity equals that of light, there is no apparent passage of time, as measured from that body. If the velocity is zero the rate of time-passage is at its maximum.

"That idea forms the basis of my time machine. Particles traveling through space at different velocities have different extensions into the Fourth Dimension. The

thing to do in order to travel into the future or the past of a certain world-point is to alter one's velocity with reference to that point.

"The only way in which we seemed likely to accomplish this was through particle vibration. No apparent passage of time can be measured from an atom, or other particle, which does not vibrate. Time becomes inexistent to that particle. Thus a particle which is vibrating at a certain rate has a different space-time relationship than a second particle vibrating at some other frequency. The two particles pass through the Fourth Dimension at different velocities.

"Having this idea in mind, I constructed that electrical machinery which you see attached to the bottom of the plane, between the wheels. That is the real time machine, and it does nothing more nor less than so alter the period of vibration of the protons and electrons composing the plane, its occupant, and the time machine itself, that their rate of progress through the Fourth Dimension can be controlled at will; that is, the plane can be made to occupy different moments of 'time' at the desire of the operator. There! That's the whole long and short of it! The time-traveler sits in the cabin and starts the electric vibrator, regulates its frequency to suit himself, and moves back and forth through the Fourth Dimension, from world-point to world-point, as he lists."

"But why attach the machine to an airplane?" I asked, deeply impressed by Brockhurst's words.

"For safety's sake. This time machine is also a *bona fide* airplane, and when traveling through 'time' it is high above ground. Just imagine the sad tale of the time-voyager who makes his journey on the surface of the ground, and upon halting his machine finds himself enclosed in a solid mountain, or resting on the waves of a mighty sea! No—the safest course is to be up in the air when time-traveling, so that upon arriving at one's destination one can move about as one desires, without fear of drowning or being crushed under tons of rock."

For a while we sat and stared at the plane. Then I rose and went over to inspect it.

"Did you ever travel in 'time' with it, Brockhurst?" I demanded.

"No."

I stopped and glared at him.

"Yet you seem pretty all-fired sure it will work. How do you know it will? Your mathematics may tell you it'll work all right, but will it?"

"It will," Brockhurst assured me. "I know. I made a model and sent it into the Fourth Dimension—though I'm not quite sure in which direction—future or past—it went."

"Are you ever going time traveling with this thing?" I inquired, designating the time machine.

"I certainly am!" was the immediate reply. "Tomorrow morning at 9:30 A. M. I set forth into the Fourth Dimension, to take a peek at our little old earth of the future. Be here to see me off, will you?"

"I will—and if it doesn't work, I'll guy the life out of you—don't forget."

And together we returned to the living room.

trols. In a minute he was taxying swiftly across the open field behind his house, soon rising into the quiet air and heading eastward. He spiraled up to about a hundred yards above the ground; then I saw a battery of electron-tubes in the time machine on the craft's bottom flash into light.

For a while they glowed brightly as the plane droned along its circular path overhead; but presently I saw that their light was dimming, and that something was happening to the plane. The throbbing roar of its engine was becoming duller—and then before my very eyes the craft grew indistinct and vanished, dissolving into nothingness, like the figment of a dream!

Yet even as the ship disappeared in the empty sky, I heard behind me the sound of a wheeled vehicle racing over the ground; and spinning on my heel I beheld in unutterable amazement, Brockhurst's time-machine roll to a halt a few paces distant! But *was* it the same craft? I peered at it more intently. Yes, it was—no, it was not! Still—! By heaven, it *was* at that! Worn, stained, coated with the gray, impalpable dust of countless centuries, braced and bound together by metal strips that it might not fall apart, still it was the same. In spite of its vastly changed appearance, some inner voice assured me of the fact.

To corroborate my inward assurance, the glass door of the cabin opened, and out clambered—Brockhurst. But how *changed*! Whereas a few minutes before he had been in high spirits, neatly garbed and clean, now his clothing hung in tatters from a bruised, scarred body, covered with red welts and blood-crusts scratches. His face was pale and distraught, smeared with dust and grime, while his hair hung in tangled masses down over his eyes.

"Hullo!" he greeted me as he emerged from the plane. "Still here, huh? I didn't miscalculate any then. Come into the hut. Let's eat. I'm as hungry as a wolf."

First I only gawked at him like a silly fool. Finally I found my powers of speech. "But—but—" I stutted in utter confusion, "We've just *had* breakfast, Brockhurst—half an hour ago or so! Say—what's happened to you anyway? Didn't the experiment work?"

He halted to stare at me, a funny little smile curling his lips.

"Sure it worked! I'm just coming back from my Time-trip!"

"But—but hell!" I protested, "You just left—not two minutes ago! I saw your ship disappear only a second before this one stopped here behind me!"

Brockhurst sat down suddenly on the ground and commenced to roar. "You ought to see the look on your face!" he gasped at last. "Honest, you look so flabbergasted—!" Anew he broke into laughter.

"I don't mind admitting I *am* flabbergasted," I rejoined dryly, greatly relieved to see that Brockhurst's injuries were not serious and evidently had not affected his spirit. "If you'd be kind enough to explain," I continued, "possibly my bewilderment would be somewhat mitigated."

Rather weakly Brockhurst rose from the ground. He nodded. "Let's go in—I'll tell you all about it," he offered. "Yes, I know I started my trip into the future only a few minutes ago. I saw myself leave. You see, I returned from my time-voyage a few seconds before I began it. Barely had I stopped the time machine and

PROMPTLY at 9:30 the next morning Brockhurst clambered into the cabin of his airplane time machine, closed the door, and moved his hand to the con-

commenced to land behind you, when I saw myself spiraling up and vanishing into the Fourth Dimension.

"Yes, I have really been in the Future—to the extent of a million years; and I spent a whole night and nearly a day there."

We were now in his kitchen, where he slumped wearily into a chair, while I began to prepare a substantial meal for him.

"The fact that I had nothing to eat during those twenty or twenty-one hours I spent there is what makes me so damn ravenous now. Make it a little snappy, will you please?" This from Brockhurst, of course.

"Keep your shirt on, keep your shirt on," I soothed. "Your grub's coming along now. Go and wash up a little—take a shower—you're positively filthy. Haven't they any baths in the year 1,001,930 A.D.? And put some mercurchrome on those cuts—or iodine, or peroxide, or something."

Obediently Brockhurst half stumbled into the bathroom, whence I soon heard the rush of water issuing. Presently my friend's snorting and blowing became dimly audible through the heavy door, and when, five minutes later, he emerged clad in a heavy bath robe, he was to all appearances a new-made man—fresh, clean-shaven, and humorous; my genial host of the earlier hours of the day, prior to the commencement of his time journey.

His mid-morning luncheon awaited him upon the kitchen table where he fell avidly to it while I, unable to resist the temptation to join him, sat down to coffee and buns.

Eating was serious business to Brockhurst, laying claim to all his attention; so he did not speak until he had finally shoved away his plate and sat back in his chair, accepting the cigarette I proffered.

"Well," he began then, after a good puff, "I presume you're waiting for my story."

I nodded. "Start from the beginning."

"Very well, then—here goes!"

I shall try here to repeat his tale as accurately and as nearly as possible in his own words, thus employing the first person; but because they seem to be confusing, cumbersome and useless, I shall, with my reader's kind indulgence, omit quotation marks. However, partly because of my own faulty memory, and partly because I found it necessary to revise Brockhurst's original rhetoric in order to make the narrative suitable for publication, I must warn the reader that this rendition is apt to be somewhat colored by my own style of expression. I am confident, though, that my reader will pardon this slight deviation from the original form. This, then, is Brockhurst's story of his voyage into the Year of Grace, 1,001,930:

AS the solid earth of my private landing-field sloped away rapidly below me, swinging around in a mighty circle as my plane spiraled upward into the mid-morning air, I must confess that all varieties of strange doubts assailed me concerning the unparalleled venture upon which I was embarking. Was it not, I questioned myself, the height of folly thus to tamper with the infinite mysteries of Time and Space—to thrust myself through the coming centuries to a period yet unconceived, with conditions still un conjectured? After all—would the experiment prove successful? To be sure, I had sent a small model of my time machine into the

Fourth Dimension; but so paradoxical, so grotesque, so unreal did the entire matter appear that my reason refused to accept the testimony of mathematics and experiment. And granting that success *did* attend my hairbrained undertaking, what circumstances, what occurrences awaited me in the distant eon I was setting forth to visit?

Might I not come to a period where human life was impossible on the world? Or might I not enter an era when humanity was subjugated by some mightier type of life? Might not I perish in the course of my time-voyage, or in the age I was intending to visit? Would I ever return to the present?

I had already closed the switch that started the time-accelerator attached to the plane, but so strongly did these various questions prey upon my mind that I was sorely tempted to open the circuit again and abstain from my foolhardy idea of flying into a future era. Yet, as my hand lingered on the insulated handle of the switch my eye caught something in the serene blue heavens to my left. I looked. First only a dim, indistinct blur was discernible; but swiftly it materialized into a definite, concrete shape—it was an airplane, and between its landing-wheels I descried a compact machine, which even at that distance, I recognized as a time-machine. *My* time-machine, attached to the very plane in which even now I rode! Evidently, then, I *was* going into the Fourth Dimension and I *was* coming back—for had I not just seen myself return out of the Fourth Dimension, and commence to glide down toward my own house?

That decided me. All my doubts were answered and allayed. All would be well. So I turned the dial that regulated the vibratory rate of the time machine and my plane, and in a few more seconds I was slipping swiftly into the Future.

Paradoxical? I should say! I had seen myself return from my time-trip *before* I had started it; had I *not* seen that return I would *not* have commenced that strange journey, and so could *not* have returned in order to induce me to decide that I *would* make the journey!

When the time machine beneath the fuselage of my plane was fairly in action the world that lay below became a blurred mass of ever-changing shades. The surface of the ground beneath me heaved and swelled like a stormy sea as with the passing centuries its level rose and fell. Gray and silent, like the spectres of long-dead worlds and civilizations, towering buildings flashed into and out of existence! Mighty cities spread and dwindled like fog before the sun. Forests and lakes, rivers and hills flitted through Time below me, momentary landmarks in the course of the ages, that were rushing by my plane. Outside my machine, time was speeding past at incredible velocity, but within my craft it passed as normally as ever.

There was no distinction between day and night. Overhead stretched a deep blue haze, through which a broad, silver-gold band marked the progress of the sun. But the most fascinating thing to me was to watch the progress of the stars. At the speed with which I was shooting through the fourth dimension they showed as fine silver lines circling, curling, spiraling and streaking through the blue skies.

For what to me seemed like about half an hour I maintained this rate of passage along the fourth dimen-

sion; then at length I determined to halt my machine and inspect the world of the future.

Before the start of my journey I had set my automatic controls to stop after the passage of one million astronomical years, and as the figures on my dials neared this number I commenced to decrease the vibrational action of the time-accelerator, slowing down my headlong flight through time, until, when my instruments registered the passing of one million years, I threw open the switch and came to a halt in the fourth dimension—or to be more precise, reduced my velocity through it to that with which you are moving through it. Then I gazed out of the plane to see what appearance was presented by the world of 1,001,930 A. D. And what a scene I looked upon!

Fading away to the horizon on every hand stretched a vast, level, sandy plain, bathed in the reddish light of the low-hanging afternoon sun. A range of low, crumbling red cliffs lay on the northern edge of the world, forming a natural barrier between earth and sky. Between me and the distant cliffs the sandy plain was dotted with immense green things of globular appearance, which I took to be plants of some nature. This assumption was soon to be verified.

Then as my craft circled around to head south my eyes discovered the most interesting thing of all—there below and before me, its hither edge not more than a mile distant, sprawled a mighty city of titanic, blue stone structures! Grim and massive, like medieval feudal castles, save that they were more squat and solid in appearance, hundreds of those great buildings stood silent and sombre in the bloody glow of the dying sun. No sign of life could I detect in their vicinity—no hurrying throngs, no wisp of smoke, no sound of traffic or industry. To all appearances the city was deserted.

Shutting off the motor of my plane, I descended toward the city in a long, gentle glide, intently studying the strange structures as I did so. The conviction that the city had long been forsaken and crumbling into decay became ever stronger as I neared it and the edifices at its edge became more distinct. Yes—for decades, possibly for centuries, few if any living beings had occupied that once mighty center of a vanished civilization. Then I slightly drew back the control rod of my plane, the wheels bumped once or twice over the sand, and I rolled to a stop about a hundred yards from the nearest of the massive buildings.

Tentatively I poked my head out of my cabin and sniffed. The air, though a trifle thinner than in the twentieth century, was of a very exhilarating quality, which led me to presume that it possibly contained an excess percentage of oxygen. I could see no form of life about me with the exception of the immense, ball-shaped plants, so I stepped out upon the level sand to meditate upon a course of procedure. Now that I was here in the year 1,001,930, what was to be done?

The air of mystery—of incredibly ancient mystery—which prevailed over the enormous city at my side captured me, so I had little to ponder concerning my immediate course of action. The city stood there awaiting me, and it would be silly to neglect the opportunity to explore it.

Accordingly, closing the door of the airplane cabin behind me, I set out to investigate the silent, ominous ruins that brooded on the desert before me.

On my way, I took occasion to give more careful

attention to the scattered globular plants that grew out of the sandy earth. They were, as I believe I have already mentioned, a very dark green in color, enormous in size, ranging from eighteen to twenty feet in diameter. From their bottoms grew hundreds and hundreds of long, thin, delicate pink tentacles that were apparently roots, for they extended into the soil. I observed that the great globes themselves did not rest upon the ground, but were stationed about two or three feet above it, seemingly supported by the countless dozens of pink roots. It appeared ridiculous, however, to imagine that those frail, slender, supple tentacles could possibly support those gigantic globes, so I perforce surmised that the globes themselves were hollow and filled with some lighter-than-air gas—being, in fact, natural balloons anchored by the pink roots. That this supposition was correct I was soon to learn—unpleasantly.

My walk to the city was leisurely and somewhat cautious; I always remained in a direct line with my plane that I might flee to it in the event of necessity, for though I felt certain that no danger threatened from the crumbling city, still I did not blind myself to the fact that there *was* a chance that it was inhabited by creatures who might entertain hostile intentions toward me.

As I have already stated, at the time of my arrival in this future day it was already late in the afternoon, the sun hanging upon the lip of the western horizon. When I was still some fifty feet from the nearest structure—a gigantic, cubicular affair topped by several flat-topped round towers—the last rays of the Day Star faded away altogether, leaving the world in a twilight that swiftly grew into dusk.

At this I halted to reconsider my intention of exploring the ancient city. My curiosity concerning it spurred in me a desire to examine it by torchlight, if necessary, while common sense urged me to refrain from foolish proceedings and wait for the morrow. And while I stood thus deliberating, I suddenly felt a soft, caressing touch upon the back of my neck—and then another upon my cheek.

With a start I spun around, facing my plane—only to stagger back in amazement at what I beheld. Hanging low in the evening air behind and above me was one of the monstrous, globular plants, a mighty dark green ball fully eighteen feet in diameter! Hundreds of its slender, pink, whip-like lashes dangled from its bottom, forming a writhing net of menacing cords, while from among them a long, sinuous green trunk extended from the gas-distended globe to the level sand, its lower end terminating in a sucking, cup-shaped mouth that evidently acted as a natural vacuum-cup to anchor the floating plant to the ground!

A dozen thin pink “roots” uncurled and stretched out toward me, and again I felt their questioning caress on throat, cheek and brow. A qualm of nausea, of unutterable loathing, swept over me; then with a low, inarticulate cry I dodged aside to flee.

But ere I had taken a step the floating plant whipped toward me upon its sinuous trunk, and of a sudden I was inextricably entangled in all the hundreds of its disgusting, writhing, snake-like whiplashes—some no thicker than a needle, others more than an inch in diameter and possessed of a strength comparable to that of the boa constrictor!

Like a babe in the arms of a strong man I was lifted

high into the air by the monstrous, malignant plant. With the fury of unreasoning terror I struggled with my gigantic, soulless captor, shouting, biting, wriggling, and kicking with all my power; but my efforts availed me nothing save to exhaust me and enmesh me the more in the merciless grip of those crushing tentacles. My clothes were ripped to tatters, blue swellings and bloody cuts showed on my skin where the rope-like arms of the great plant had squeezed and torn my body. Torn—yes—torn! Several of the tentacles, that strange fight taught me, had fine, needle-like spikes near their ends, which scratched and cut me in dozens of places!

Now I discovered that the monstrous plant had left the ground and was slowly floating upward, while dozens of small, sucking mouths attached themselves to the open wounds of my body, to draw in the life-blood that flowed from them.

A groan of dismay broke from me. Was *this* to be my fate—to die out here in this man-forsaken era, beneath the sucking lips of a vampire that belonged to the realms of hell? No—no! I couldn't die that way. Somewhere I had a large-bladed pocket-knife in my possession; if only I could get it—!

Anew I began to fight and struggle, my hand working gradually toward my right hip pocket. The beast-plant that held me constricted its powerful arms, crushing my ribs together and wrapping a choking tentacle around my neck. Soon my breath was stopped and my head commenced to reel; my vision became blurred and misty; my eyes watered profusely. Lord! I couldn't fight any longer—!

Somehow my fingers gripped the knife that lay in my pocket; with one hand I opened both its blades, and then I started to cut. Vaguely I felt the blades encounter yielding surfaces, and presently the pressure of the entangling lashes began to lessen. At last my right hand was free. Already I hung on the brink of unconsciousness when my knife at length found the pitiless tentacle which was throttling the life from me and commenced to saw upon it. Luckily the strand was a slender one, so it took but a few moments ere it was sundered and the deadly pressure against my throat was relieved. Unwrapping the coiled arm of the plant from about my neck I flung it away, to return then to severing the remainder of the writhing lashes. After what seemed hours of frantic slashing, the strongest of them were cut through, while the lesser of them were not sufficiently powerful to restrain me from breaking loose. Released of their tight clutch I slipped downward through the writhing net and plunged heavily to the sand beneath—free!

During the course of my aerial battle with it, the flying plant had floated a number of yards eastward, ascending to an altitude of eighteen or twenty feet. My drop of some twelve feet to the smooth, packed sand underfoot had considerably shaken and bruised me, leaving me trembling and exhausted as I lay half dead upon the ground. My teeth chattered in my shuddering, as I thought, with cold sweat exuding from every pore of my body, of the grisly fate that I had just escaped by the barest of margins.

When I had slightly recovered my breath and strength I grasped my knife and staggered giddily to my feet. Then I turned to the time machine resting upon the desert a hundred yards away.

But I had not taken two steps in its direction when

I halted, my heart leaping. Clustered around the plane, their long, pink, snake-like tentacles running inquisitively over it from end to end, were fully a dozen of the titanic globular plants. Others hung in the air over it, or between me and the plane, while several were drifting slowly toward me!

I shouted hoarsely, then turned about and fled precipitately to the shelter of the nearest great building that loomed ominously out of the gathering gloom. Here I stumbled up a low series of steps and plunged through a rectangular, crumbling stone aperture that gave entrance to the structure. Within, I found myself in a long, dust-covered corridor, dimly lighted by a row of small, grimy, luminous glass globes. That the place had been in disuse for a long period was amply testified to by the cracked walls, the many broken lights, and the gray dust that lay inch-thick upon the uneven floor.

Turning into the first doorway at my left I entered a dimly-lighted rectangular room of sizable dimensions, sparsely furnished with an age-old table and a few chairs, while against one wall stood a low, broad couch piled with ancient cloths. Apparently in some bygone day this had been the apartment of some long-dead inhabitant of this desolate, decaying city.

In the nearest chair I sat down to speculate. The situation in which I found myself certainly was not an enviable one. I was without food or drink in a world-old pile of ruins where there possibly existed not a single drop of water or a crumb of bread. Weapons I had none save my puny pocket-knife, and surrounding the city on every hand were countless hundreds of immense, formidable vampire-plants, any one of which stood an excellent chance of bringing about my doom. My precious time machine was effectively guarded by those enormous flying beast-plants, so I had practically no chance whatever to reach the plane, let alone escape with it.

Yet—I *would* escape with it, for all that. It was so decreed. Had I not, with my own eyes, seen myself appear out of the fourth dimension back there in the Twentieth Century, and glide down to my landing-field? Surely then, I *was* destined to return to my own age safe and sound.

Just then my ears caught a soft, stealthy sound behind me, like the tread of a padded foot. With thumping heart I spun around in my chair, my imagination picturing weird and terrible creatures creeping upon me from behind. But the very fact that my eyes awaited some amazingly unusual entity, some awful thing of monstrous form, caused me to be only the more astonished at what I beheld, for that which met my gaze was the most commonplace thing in the world—it was a man. Yet so incongruous, so utterly foreign did the familiar and commonplace seem in this grotesque, unreal world, that I was prone to attribute his presence to some trick of my own imagination. However, despite all that, he was real.

Old and wrinkled, toothless and bald he was, with a coffee-brown skin whose texture suggested leather. He stood about five feet nine in height, clad in a simple white cloth tunic lashed about his waist by a broad belt from which depended two pockets, one at each hip. The one contained a long knife, the other a contrivance that appeared to be some form of revolver.

A minute passed during which the strange man and I regarded each other in silence. Then he spoke—in

a tongue that despite its odd accent and unfamiliar pronunciation I recognized as English.

"Are you Anton Brockhurst?" were the old fellow's opening words.

At that I almost sat down on the floor. "*What?*" I cried in utter amazement.

"Are you Anton Brockhurst?" he repeated. "You must be. My history tells me that there was but one man alive on earth when Anton Brockhurst came out of the past in his time machine. I am the last man! Therefore *you* must be Brockhurst!"

Honestly, you could have knocked me over with a feather. So astounded, so utterly flabbergasted did the ancient one's words leave me that I could but stand and gape at him in thunder-stricken silence. I was gasping like a fish out of the water as I slowly gathered my wits to reply to the old man's speech. At last I was able to articulate.

"What—what—how . . . Yes, I am Anton Brockhurst, but how do *you* know my name?" I stammered. "Have—have we met before? I—I'm afraid I can't place you."

Imagine me jawing such ridiculous rot to a man who lives a million years after us!

The old fellow smiled at my evident perplexity.

"I thought so—I *knew* so," he said. "When I was not yet the last human being on earth I learned from my history tablets, which were written about five hundred thousand years ago, that one Anton Brockhurst, a native of the year 1930 A. D., built a time machine with which he traveled a million years into the future, where he found the Last Man. The Last Man, desiring to see others of his kind before he died, prevailed upon Brockhurst to return with him, in the time machine, into the Past—to the year 502,101 A. D., where the machine's arrival was duly recorded in the histories. When the Last Man was born, half a million years later, he read those histories, and thus he knows now that his rescuer is named Brockhurst. All very simple, is it not?"

Sitting weakly on my chair, I nodded. My mind was tumbling with doubts and wonderings. Once more I was confronted by one of the inexplicable paradoxes of time-traveling. Here this man had learned my name *before* I told it to him; he had learned his own future *before* it transpired, through history books written half a million years before his birth, and yet that future of his could *not* have been written into the histories of 502,101 A. D. if it had *not* first occurred!

Tiredly I shook my head; the riddle was too deep for me. Yes—even for me, the man who invented the first time machine!

"But—but," said I at length, "I don't know if I can take you with me into the Past. My time machine is constructed to accommodate but one person."

"But you *must* take me with you! You *will* take me with you! I *know* it! You cannot desert me here, in this God-forsaken, manless age! Tell me, tell me that you will take me with you!"

"Well, I'll see what I can do," I promised. "But frankly, I don't see how I'm going to do it."

"But you will find a way. The history books say that I *did* come to the year 502,101. I want to see other humans once more before I die. For nearly sixty years I have been the last representative of our kind on the earth. Yes, you must find a way."

"I'll try," I assured him, and for a long time we lapsed into silence.

"Where—where am I?" I finally inquired. "What city is this, and to whom does it belong? How old is it?"

"This is the city of Kur," responded the Last Man, drawing up a second chair and dropping into it. "It is a remnant of the Last Civilization, which began about six hundred thousand years ago and reached its heyday around 550,000 A. D. A hundred and fifty thousand years later, at about 700,000 A. D., it began to decline, and by 900,000 A. D. it was almost completely wiped out. It destroyed itself as all its predecessors, the prehistoric civilizations, destroyed themselves. Greed and avarice, lust for power, oppression of the weak and rebellion of the untutored—it is the same old circle over and over again. They rise, they flourish, and they fall.

"When the wars and revolutions had blotted out culture, art, and science, the peoples of the earth were reduced to the savagery from which they had sprung; and then it was the advent of the Martian vampire-plant that completed the ghastly story by killing off the ignorant, unprotected barbarians who once had been the Lords of the Earth. In the last hundred thousand years the toll of human lives taken by flying plants was so enormous that the perpetuation of the race was placed hopelessly into the shadow. Now you see the result—I am the Last Man. Up to sixty years ago there still remained three or four of us, but the others, too, died of old age or were captured unawares by the floating plants and killed."

"The flying plants—they are of Martian origin?" I asked. The Last Man nodded in reply.

"I have had an unpleasant experience with one myself," I went on; "I gather from their appearance that they are hollow and filled with a lighter-than-air gas."

"Quite so," agreed the Last Man with a nod. "They are filled with hydrogen gas, which they extract from the water-vapor in the air and also from the moisture in the ground. It is their presence which has made a desert of our world. Even our oceans are fast receding before them. In a hundred thousand more years there will be no more water on Earth. They are transforming our entire planet to a vast desert, just as they have transformed Mars to a desert. The gigantic waterways built on their planet by the ancient Martians are covered with huge swarms of these plants, seeking to drain up the last few drops of water so that the hydrogen may be extracted and stored in their hollow bodies. For the same reason they attack animals, or other plants containing water—to suck forth the liquid, expel the oxygen and retain the hydrogen that they may float around more. I wonder to what purpose all their mad blood-greed is. It seems to me that their existence must be as aimless as was that of Man."

"Evidently the fact that you are the Last Man has placed you in a position to judge your species," said I, wishing the old fellow's philosophy were less pessimistic, "knowing the faults and foolish deeds of your ancestors."

The Last Man smirked. "And having nothing to look forward to," he rejoined. "When I am dead—then what? The human race has come and gone, with nothing to look forward to," he rejoined. "When I am dead—then what? The human race has come and gone, with nothing to mark its one-time glory, its might, and its

world importance except a few old piles of crumbling masonry that soon will follow their builders to the primal dust whence they came! Were you a woman, there might yet be a glimmer of hope; but you are a man."

"And glad of it!" I thought.

Aloud I turned the conversation again upon the flying plants.

"You say that these vampire-plants came from the planet Mars. How did that ever happen?"

"Ah! It is suspected that they were deliberately brought to this world during the last Martio-Tellurian war, in 700,000 A.D., by the invading fiends from the red planet! Was ever a more hellish plot conceived? Knowing that our entire civilization, culture and progress depended upon that most precious element, water, the Martians brought along young vampire-weeds from their world and released them upon our own!"

"Considering the tremendous rate of growth which the plants have—they develop from seed to maturity in the course of a single day, a condition which was necessitated in their evolution by the extreme atmospheric changes that take place upon their native planet—it is not to be marveled at that in a comparatively short time our oceans commenced to disappear, our atmosphere became dry and moistureless, and our fertile soil changed into an inhospitable, hot red dust. In addition thousands of humans and animals fell prey to the greedy tentacles of the flying vampire-weed. Our nutritive vegetation withered and died away in the dry soil and through lack of rainfall. Is it any wonder, then, that our mighty civilization, which so proudly boasted of conquering the universe, collapsed and decayed before the rudimentary intelligence, or instinct, of the vampire-plants?"

I did not reply, for this topic of the downfall of man had become most distasteful to me, so we sat in silence for a time. Then the old fellow asked suddenly, "Where is this time machine of yours?"

I told him, and upon his request narrated the entire story of my voyage from 1930 A.D. to 1,001,930 A.D.

When I had completed the tale, he suggested that we obtain some much-wanted rest—a proposal to which I readily acceded, being rather exhausted from my vicissitudes since my arrival in 1,001,930 A.D. Accordingly, at the Last Man's gesture, I cast myself upon the broad couch that was his bed, while he, extinguishing the light by pressing a button in the wall, lay down beside me. The last thing I recall before I dropped off to sleep is the Last Man's voice reaching me out of the darkness.

"And tomorrow you will take me with you into the past?"

The old fellow's persistence irritated me. Why couldn't he wait until morning, when I would be in a better condition to think it over? So rather tartly I answered:

"I really don't see how I can do it! Frankly, it's impossible!"

The Last Man said no more, and presently we fell asleep—at least, I did.

ALREADY the sun stood well up over the eastern horizon when my lids slowly opened. I turned my head to see whether the Last Man still slept but found that he had apparently already risen.

Sitting up, I stretched and yawned and rubbed the slumber out of my eyes. Then I rose to my feet and walked across the floor of the chamber to the doorway

that opened to the corridor intending to inquire of my strange host whether one might have water wherewith to cleanse oneself and whether anything edible was to be had in the ancient city of Kur.

But the old man was not to be seen in the corridor outside the chamber. So, turning to my right I sauntered along the gallery to the rectangular entrance way, and here glanced cautiously about in the vicinity of the structure. Nothing stirred.

Casting my eyes toward the time machine, which rested on the sand a hundred yards to my right, I beheld a sight that made my heart jump. Scattered on the desert around the plane were a dozen or more great, torn, leaf-like things that I saw were exploded vampire-plants, while a number of others hovered in the air, surrounding the machine. Even as I looked, one of them burst with a terrific noise, just as a toy balloon does when suddenly pricked by a pin. I am quite sure now that I know what caused the plant's explosion. It was the sunlight. Under the growing heat of the sun's rays the hydrogen gas, so greatly expanded within the membranous, globular bag that finally the thin skin was unable to resist the increasing gas pressure and broke open. The bursting plants scatter afar the seeds or spores, which take root in the soil and grow with incredible speed during the daylight hours. When night comes they break loose from the soil and float up into the air—the huge, bloodthirsty monsters of my previous evening's experience. The next morning the sunlight bursts them again.

Yet it was not this which riveted my attention. It was the sight of the Last Man standing beside the time machine, his revolver-like instrument glittering in his hand. The door of the plane's cabin yawned open, and from the looks of things he had been minutely inspecting the craft.

I shouted at him and waved my arm, at the same time breaking into a run toward him. He shot a hasty glance in my direction; then in rapid succession five flashes of red flame spat from his gun, and at each shot a hovering vampire-plant vanished in a thunderous explosion of yellow fire. In a trice only a few flakes of blackened ash were swirling through the air where previously had hung the grim, flying plants.

The last of them had hardly disappeared when the Last Man ducked into the cabin of the plane, slamming the door behind him. Before I guessed what he was up to, the ship's propeller began to spin (I have a self-starter in the craft so that the pilot can spin the propeller by himself from within the cabin), and when I was still fifty yards distant it was roaring lustily. A moment later the plane commenced to roll off across the sands, gathering momentum as she did so, and as I came to a halt with a dawning realization of the old scoundrel's purpose, she rose gently off the ground and sped skyward in an easterly direction.

A shout of horror, of despair leaped from my throat and an imperative call for him to halt, to return. But I doubt whether he even heard me. A minute later, with sinking heart, I watched the machine become a misty blur in the blue skies overhead and vanish into Time! With a low groan I slumped limply to the desert sands and buried my face in my arms.

What a fate had overtaken me! Here I was marooned in Time, in a distant age of the future, without means of returning to my own era, stranded in a world

of crumbling ruins, of fruitless earth, populated only by the weird vampire-plants from an alien planet and, worst of all—I was alone! *Alone!* That was what made the terrible blow doubly cruel. Had I had even a single companion to share my miserable exile, the overwhelming despair that weighed me down would have been at least slightly mitigated by the consolation of knowing that there was another human being nearby, but to be left thus alone—the *only* creature of my species upon the planet—was almost more than I could bear.

Wearily I raised my head, rose to my feet and walked unsteadily toward the crumbling city of Kur. I did not know whither I was going, neither did I care. Bitter self-reproach filled my mind. I should have promised the Last Man that I would return to the past with him; then he would not have stolen the machine! What a fool I had been in the first place even to think about time traveling! What a misguided ass I had been to start out on this accursed, hare-brained adventure! Why, oh, why had I not obeyed the impulse to remain in my own time? But then—I had seen that time machine appear suddenly out of the sky, back in the year 1930, so it seemed that I *was* going to return. Yet—*was* I? Perhaps my eyes had played me false; perhaps it was not my time machine at all that I had seen, but an ordinary airplane emerging from some wisp of mist that had at first rendered it so indistinct! Or perhaps some scientist of my own age had invented a device whereby to produce invisibility, and attaching his machine to an airplane had rendered the craft invisible. What I had taken to be my time machine had probably really been this machine coming out of its state of invisibility. Or possibly it *had* been my time machine which I had seen, but with the Last Man at the controls instead of me!

No matter which of these possibilities was the true one, the fact remained that my deplorable position was in nowise remedied by this fruitless conjecture. The only thing for me to do in this sad situation was to make it as bearable as I might.

Utterly crushed and despondent, I wandered long through the empty, cracked stone avenues of Kur, my footfalls ringing hollowly—mockingly—as I stumbled blindly along my purposeless route.

Thus it was by pure accident that I meandered into an immense, tottering structure that reared ponderous and imposing, majestic in all its decaying splendor, half a mile or so from the spot where on the previous evening my time machine had landed. From the various features that were in evidence as I entered the enormous circular lobby of the building, it was ostensibly some sort of exhibition palace or museum. Orderly rows of large glass cases stretched away from the central lobby, covered with the gray dust of numberless millenniums and filled with strange and interesting relics of the Last Civilization. To a small extent, these wonderful displays served to assuage the despair that gripped me; but though I attempted to interest myself in the strange, silent machines that filled the glass cases of the nearest row, I was unable to discover anything of their purpose, since their construction was beyond me and I could not read the odd characters of the printed placards posted in the cases.

Slowly I moved along the row of glass cases, many of which were in a serious stage of disrepair, with their fragments of glass and other débris littering the floor before them. Stirred up by my feet, the impalpable dust of long-dead centuries rose in a thick, choking cloud,

swirling lazily in the air and sinking down again to the floor when I, who had so rudely interrupted its age-long peace, had passed.

When I came to the last great case in the row, not far from a rotting archway that opened upon a capacious stone court, I checked my progress to stare first in momentary interest, then in incredulous astonishment, and finally in doubting puzzlement, at the single exhibit that reposed within the glass-sided case.

Could it *really* be—? No—no! That was impossible! Ridiculous! Absurd! But still—Frowning, I glared at the thing in the box—silent, motionless, dust-covered and braced with metal bands to prevent it from falling apart—but despite my incredulity I saw that it was really what I thought it to be: *there was my own time machine!* The very plane with which I had come to this far-off age—the very machine that had spanned a million years of time—the very machine with which the Last Man had vanished into the Fourth Dimension not more than an hour before!

So dumbfounded did the cognizance of this truth leave me that I suddenly sat right down in the inch-thick dust that carpeted the floor, blinking with unseeing eyes at the silent machine in the case.

How, in the name of all that was holy, did that time machine get there? Through what queer freak of time had it returned to 1,001,930 A.D. when I had seen it vanish into thin air but an hour earlier? For five long minutes my very amazement kept me from grasping the obvious truth. But at last I saw light. Of course—that was how it worked!

When the brown-skinned Last Man had clambered into the plane that morning after familiarizing himself with its controls, he had flown back to the year 502,101 A.D., just as the history books written at that time had taught him he would. There, evidently, he had ended his days, and the time machine, for some reason or other, had been placed in this museum, to be found by its own builder half a million years later!

Of course that elucidated the entire affair! But my mind whirled as it grappled with the new paradoxes that attended this explanation. It meant that during the preceding night the *same time machine* had been in *two different places simultaneously*; at the one spot it had been in a new, spick-and-span condition while in the other place, half a mile distant, it had been a machine so incredibly ancient that only the metal bands around it served to hold it together! This archaic machine had been standing in this case for countless centuries. All during the time that the Last Man had awaited my arrival out of the past, that he might appropriate my machine, that very same instrument of escape from his eon had been standing quietly in its case, only half a mile away! It had been waiting there *before it arrived there*, yet it could *not* have waited there if it had *not* arrived there first! What would have occurred, I wondered, if the Last Man had returned to 502,101 A.D. with the machine that already stood there in that case? But he couldn't have done that, for then he would have been taking the time machine out of its location long before it arrived at that location, and I, after arriving in 1,001,930, would have returned to 1930 with the original, new machine; so I could not have left it in 1,001,930 that it might go back to 502,101 A.D., where it could be put into a museum case for the Last Man to find. My brain reeled groggily at this tangle of contradicting facts and common sense.

At length a doubt crept into my mind among my musings. Would this old, decrepit time machine, so long out of use, operate?

I rose and kicked at the glass wall of the case, shattering it into a thousand fragments. Then I stepped into the case and carefully examined the plane and the time machine. The first glance into the cabin assured me that it was indeed my own machine, for engraved upon the metal-work within the cabin I found my own name and the serial number I personally had put there.

Beyond a few necessary minor readjustments, nothing appeared amiss with either plane or time machine, save that both were fearfully dry and in need of oil. Therefore, breaking out one entire wall of the exhibition case that the machine might pass through, I rolled it out of the case and upon the stone courtyard outside. Returning then to the museum, I searched about for three long hours until in hermetically sealed cans I found oil and gasoline, water, grease, and alcohol. These containers I opened with the tools that I found still in their proper place in the time machine. It took me nearly the whole afternoon to get the motor of the plane and the time machine into working order, but at last the task was done. Clambering into the cabin, I started the two motors

and was soon skimming across the stone courtyard of the museum, presently rising and spiraling upward into the blue firmament. The plane was in anything but perfect condition, but it satisfied its purpose.

When I was a hundred yards above the paved square I manipulated the controls of the time machine until in a minute only a misty blur showed beneath me.

Soon the decreasing numbers of the meters warned me that I was coming close to 1930 A.D., so I commenced to decelerate my backward flight along the Fourth Dimension more and more, until at last, when my instruments registered zero, I stopped altogether and began to glide down to the welcoming field behind my home. As I descended, I looked into the sky ahead of me. There I saw a plane spiraling upward into the heavens—*my* plane, with *my* time machine attached to it. A moment it swung around, became a blur in the blue heavens and was gone—into the future—to the year 1,001,930 A.D.—upon the weird, paradoxical voyage from which I had just returned!

Paradoxical? My dear fellow, the Einstein Theory is full of apparent paradoxes, yet to him who understands it there is no inconsistency whatever. Give me another cigarette, will you, Frank?

THE END

What Do You Know?

READERS of AMAZING STORIES have frequently commented upon the fact that there is more actual knowledge to be gained through reading its pages than from many a text-book. Moreover, most of the stories are written in a popular vein, making it possible for anyone to grasp important facts.

The questions which we give below are all answered on the pages as listed at the end of the questions. Please see if you can answer the questions without looking for the answer, and see how well you check up on your general knowledge of science.

1. What was the first steam engine recorded in history? (See page 869.)
2. What very modern steam engine is of the type of the first one of many centuries ago? (See page 869.)
3. Was atmosphere pressure ever used to actuate an engine? (See page 869.)
4. What was Watt's great invention? (See page 869.)
5. What is the general statement of the second law of thermodynamics? (See page 869.)
6. If a reaction driven airship had to discharge projectiles or their equivalent from her bows, what could she do to maintain her speed? (See page 876.)
7. How could an opaque black object in space be detected by the telescope? (See page 877.)
8. Can you describe the relations of the cycles of animal and vegetable processes? (See page 878.)
9. What are the names of the satellites of Mars? (See page 887.)
10. Where does the nearer moon set on Mars? (See page 887.)
11. What character of storm do astronomers believe they see upon Mars? (See page 890.)
12. What planet can claim the earth as its nearest neighbor? (See page 946.)
13. What is the composition of the air? (See page 948.)
14. What might be the effect upon the composition of the air of covering the earth's surface with buildings? (See page 948.)

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