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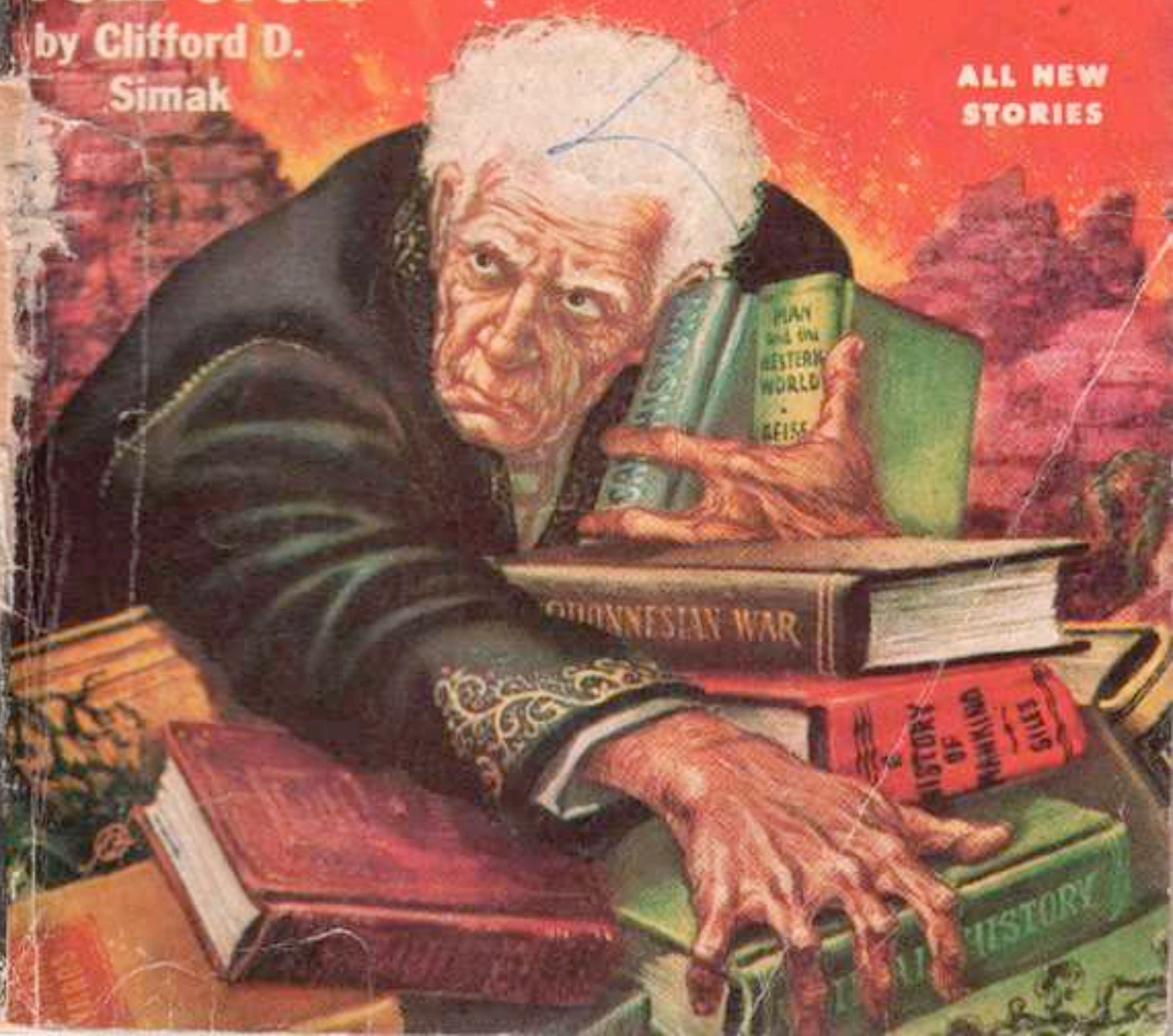
SCIENCE FICTION

FULL CYCLE

by Clifford D.
Simak

STORIES

ALL NEW
STORIES



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Length, width, and thickness are dimensions, and interchangeable; time is regarded as a dimension, too — but of a different order!



TIME'S A GORILLA

by **RUSS WINTERBOTHAM**

LET ME SAY at the beginning that Gideon Alexander no more traveled in time than anyone else who has lived, for time traveling is simply living. But to explain what happened will involve a great deal of testimony, which I hope I can present so that anyone—be he a scientist or a schoolboy—can understand.

"Let me tell the story, Gid," I said after the episode. "If you tell it yourself, it will

simply be laughed at as an impossible fiction. But no one will think that Dr. Joseph R. Bundidge, who deals in inflexible mathematics, would try to wipe his own science off the books."

"All right, Joe," said Gideon. "On one condition; you mustn't intimate that it's time travel, because it wasn't. You must present it as an entirely new conception of time and hyperspace."

That, in the main, was our

agreement. I must point out, however, that I came close to believing that it was time travel—or something along that line—at several stages in the adventure.

Strangely enough it began one hot, August afternoon on the golf course. The game itself was so overshadowed by what happened afterwards that I even forget who won. Gid, Herb Forsythe, who is a real estate man, and Dan Bobbert, who is in insurance, and I had been playing a conversational game. None of us was very good at golf, but we liked to talk.

We discussed sex, politics, God, and business. It was about as rousing a bull session as anyone could have on a day that was too hot for deep thinking.

Finally we got around to science, and in this field Gid and I did most of the talking. Finally Dan said: "I wish you'd come over to the house some night and help my son out in his high school science course, Joe. He asks the damnedest questions."

"Better let his teacher straighten him out," I said. "There's so much in science today that's controversial, I might confuse young Dan, instead of helping him."

"You could at least spend five minutes explaining the Einstein theory to him," said Dan.

Gideon almost choked with laughter. "Five minutes!" he screamed.

"What's so funny about that? Didn't Einstein say that time was a dimension, or something like that?"

Gideon sobered immediately. "Einstein, Minkowski and everyone else notwithstanding, time is not a dimension," he said; "and I can prove it."

I was curious about this statement, but on a golf course with a couple of people who probably thought nine-tenths of science was nutty anyhow, I didn't ask questions. But I filed the statement away in my mind and listened.

"What is a dimension, anyhow?" Gideon asked; being purely rhetorical in his question, he gave the answer. "We say there are three of them, length, breadth and thickness. There are other names such as depth, height, and so on, but there are three for most practical purposes."

He paused and picked up his golf ball. "Now I defy you to tell me which diameter of this ball is length, and which is breadth, and which is thickness!"

"It depends on which way you hold it," said Herb.

"That's right. There's no distinguishable difference, except an arbitrary standard, depending on which way you look at something. You can

substitute the terms, length and breadth and thickness for any dimension and it doesn't make a dime's worth of difference in an object like a golf ball. But you can tell time from any other dimension."

That satisfied Dan and Herb, but it didn't satisfy me. But as I said, this wasn't the time and place—speaking of dimensions—to discuss it.

DAN AND Herb had to hurry back to town on business, and so after we'd showered and dressed, Gid and I had a bottle of beer and I brought up the subject again.

"You're not thinking about revising Einstein are you, Gid?" I asked. Gideon was young, only about thirty, and full of enthusiasm; but he lacked a lot of experience which tells us older people to go slow when you clear ground for a new building.

Gideon laughed. "It's a pet hobby of mine," he said. "People are always coming up with the statement that time is a fourth dimension. Actually no scientific man says that it is. Time can be treated as a dimension in mathematics—but if time is a dimension it is altogether different from any other dimension. As I pointed out, the other dimensions are almost

identical in physical properties."

"You said 'almost,'" I reminded; "isn't that an understatement?"

"No." Gideon sipped his beer. "There is a difference. I tell you what, Joe. The explanation is long and involved, but extremely fascinating—especially to a mathematician like you. Instead of getting ourselves overheated, let's table the matter. The next cool day, drop around to my house and I'll have something to show you."

"Okay," I said. "It's a date." Then I grinned. "One thing that bothers me though," I said, "is how you can say that time is not a dimension because it is different, and then argue that there are differences in the other dimensions."

"It does sound conflicting," he said with a laugh. "Actually, it isn't. You can examine a Negro, a Mongolian and a Caucasian and determine that, in spite of superficial differences, they're basically the same. But if you try to apply the same yardstick to a gorilla, you'll get into trouble."

"All right," I said. "So time's a gorilla."

MAYBE I was wrong, but at the time I figured

Gideon was just a young fellow with more enthusiasm than stable ideas; I'd almost forgotten our conversation when he brought up the subject again, when I met him on the campus in the fall.

The semester had started, but the football team was going out of town the next weekend, so he invited me over to his place the following Saturday afternoon.

Strangely, I looked forward to the date. Perhaps subconsciously I feared that he might come up with something, and my science of mathematics might become obsolete overnight. However, had I been sensible I could have easily reassured myself that no matter what happens in the other sciences, mathematics is unapt to change much in fundamentals. All mathematics goes back to the fact that normally man has ten digits on his two hands. Even if some mutation changes this, we can hardly conceive of ten being anything else but ten.

But mathematics has come up a long, spiral path. It goes much farther than ten, and it has invaded abstractions such as the square root of minus one, and certain kinds of decimals that can't be explained. And in mathematics we can play around in the fourth dimension—even the fifth

and the sixth dimension—without being hauled off to the laughing academy.

The higher you go in mathematics, the stranger the world seems. The stability of figures is not perpetual. There's some strange kind of gravity that makes it impossible to build your cubes and pyramids and spheres into infinity. Surprisingly enough, you can find one kind of infinity exceeding another kind, and one kind of zero being less than another kind. Laymen find this sort of thing somewhat ridiculous, but a mathematician can talk about it with a straight face.

GIDEON lived in a small house, not far from the campus. A housekeeper came in every morning and straightened up the places that a man finds hard to keep in order; otherwise, Gideon kept house for himself. He did his own cooking, and he had a laboratory fixed up in the basement. I'd seen the lab many times, but since I am a mathematician, my interest in physics is purely academic.

He was waiting for me with a cocktail in his hand as he opened the door. We drank the cocktails—Manhattans, I think, but I've forgotten—then went to his laboratory.

It was well kept from a man's viewpoint. A woman

might have looked with askance at the dust, the oil spots and the worn paint, but a woman's standard of neatness is different from a man's. Everything in the laboratory was in its right place, where Gideon knew where to find it. That's my idea of good housekeeping.

My eyes focussed at once on a complicated piece of apparatus in one corner. I noticed it because it was so different from anything within my experience that my curiosity almost boiled.

It wasn't the vacuum tubes, the wires, the dials and stuff that were mounted on a sort of control box underneath it. It was a sort of shimmering L of iridescence that seemed to hang over it.

"Before we start," Gideon said, "let's review a few facts, just to make sure our minds are synchronized." He motioned to a stool in front of a laboratory bench and while I perched on it, he brought out a wooden box and sat down on top of it.

"When I started out on this thing," he said, gesturing toward the machine, "I shared the popular view that time actually was a dimension. And then I ran into a blind alley when I stumbled onto the argument on the golf-course. Time is easily distinguished from length, breadth

and thickness because it is different.

"But I remembered some things about atoms. Right-hand and left-hand atoms, and how they seem to do tricks in another dimension. So I set out to find differences in the three dimensions. It wasn't easy." He laughed. "I found some that are exceedingly difficult to explain, because the Fitzgerald contraction has an application in varying dimensions that makes these differences hard to discover."

He reached into a drawer and pulled out a battered notebook.

"Here are the mathematics," he said; "you can read it better than I can explain it."

I glanced over the figures. I'll admit that I didn't check them clear through; it would have taken days to do that. But fundamentally, he had given Euclidean geometry a mortal wound. No one would ever be able to say again that two parallel lines never meet, or repeat any other axiom as such.

He showed, according to his figures, minute differences between pure length, and pure breadth, and pure thickness. Using his figures, it would be possible to sort out the different dimensions of a sphere as easily as one might sort out different

strands of colored yarn.

"Your mathematics seems all right," I said, "but there's a big step between the world of figures and the world of fact."

"I found that out," Gideon said, "when I tried to construct my machine. I called it the Time Meter, simply for want of another name. I think I mentioned before that when I started to work on this thing, I was convinced that Time was a dimension."

He got up off the box and walked over to the machine. I started to follow, but he motioned me back. "High voltage," he said; "you're safer where you are. And I assure you, there's no sleight of hand about what I'm going to show you." He turned and motioned toward the shimmering L. "Does that look strange to you?"

"It certainly does. Somehow, it doesn't look real."

"It's as real as a lightning bolt or a ray of sunshine," said Gideon. "In view of the fact that I'm dealing with some curious dimensions, I had to construct my figures from energy instead of wire, or plastic, or other substances. What you see here seems to be a right angle that glows; actually it's two cubes."

I looked at it. There was nothing cube-like about the business. It was simply two

straight lines, joined at a right angle, and I told him so.

He laughed. "Supposing they're two lines, as you say—at least you'll admit they're not parallel."

"From a Euclidean standpoint, they're not because they meet," I said. "But your mathematics sort of upsets that—"

"Euclidean concepts hold true on relatively small surfaces," he said. "These lines are not parallel, and even if they were, you'll have to admit that they meet at one point."

"Unless my eyes deceive me."

"Therefore, two one-dimensional lines can have one point in common. If they were cubes, which you do not admit, they might have a surface in common, or if they were planes, they might have one dimension in common. Is that correct, mathematically?"

"Yes."

"But it is also possible for two cubes to have one dimension in common?"

I could imagine a cube up-ended on one corner so that a single edge touched the surface of a second cube. So I said: "Yes."

"Even a point in common?"

In this case, a cube would be turned so that one corner touched the surface of the

second cube. I nodded.

"Now in constructing my cubes, which you see simply as single lines, I used three dimensions. But neither cube is made of the same dimensions because I was able from my figures to deduce what qualifications a fourth dimension must have in order to exist.

"Cube No. 1, which is the one you see as a line parallel to the floor, consists of width, thickness and Elsewhere. Elsewhere is the other dimension, since I have discovered that it cannot be time. Cube No. 2, which is the upright line that is visible, consists of length, thickness and Elsewhere. Since they each have two dimensions in common, they are touching on a plane surface."

"But they're not cubes and touch only at a point," I insisted. "My eyes tell me that."

"Your eyes cannot see Elsewhere, and the thickness is the line connecting with Elsewhere in each case, so it cannot be seen beyond a microscopic segment in which it vanishes."

"Then it's a question of whether I should believe my eyes or your logic?"

"No," said Gideon; "believe what I'm about to show you."

HE TURNED a switch on the control panel. There

was a hum of electric current and the vacuum tubes glowed. Then he set a stop-watch, which had an unusually large dial which I could read from where I sat, on the panel. He pointed to a button.

"When I press this," he said, "the cubes—or what you see—will disappear because I will have removed one of the dimensions of contact. After that the cubes will exist as twin planes—one being of width and thickness, the other as length and thickness. The question is, therefore, what dimension is Elsewhere? If it is time, the cubes will cease to exist in time and vanish completely. Time will stand still for them, and when they reappear they will be behind us in time and never able to catch up with us. If Elsewhere is not time, they will reappear just as they are now because your mathematics can easily show that a dimension can be removed and replaced without losing the figure, unless time is involved."

"Before you press the button," I asked, "tell me how you know they are cubes? How do you know there is an invisible dimension in their construction?"

"By the same way man has figured out the distance to the moon," said Gideon; "he

knows his mathematics is right."

I resolved then to check his figures.

He pressed the button. The cubes faded from view and the second hand on the stop watch started to move. For twenty seconds the hands moved forward, then Gideon pressed the button again.

Out of nothing came the shimmering light of the iridescent L. But this was not all.

For a single second I thought I saw a face—a human face—a woman's face staring at us from between the divided lines of the L!

I looked quickly at Gideon, but he had turned his head and apparently had not seen her.

"The fourth dimension, couldn't be time," he said, "or the cubes would not reappear."

I was staring at the spot where the apparition had vanished. I raised my hand and pointed. "That face!" I said hoarsely. "Staring at us!"

He turned quickly, and when he turned back he wore a perplexed smile. "You're having hallucinations, Joe," he said; "I don't see any face."

"It's gone now." I described it, tried to convince him of what I saw, but he didn't seem to believe me.

"Next you'll be saying, after the manner of all mystery stories, that I'm fooling around with something we'd be better off leaving alone," he said.

"I'm only telling you what I saw. And I might add, it didn't look dangerous to me; if I were your age, I'd want to see it often."

"You're not too old for ideas along that line," Gideon said. "But to return to our experiment. If the dimension is not time, what is time? Time certainly has dimensional characteristics, but it's still a gorilla. And what is the gorilla of the dimension family? It's the point! The point is the zero dimension; it's a single, spaceless spot. An infinite number of points make a line, an infinite number of lines make a plane, an infinite number of planes make a solid. But how can something of zero size reach to infinity? It's simply because there is no zero any more than there's infinity."

"I have been broke," I said; "I know there's a zero."

"We're not talking about the same things," said Gideon. "You're talking about money; I'm talking about dimensions. And I'm saying, that the reason time can be treated as a dimension is that it is a part of all dimensions, even Elsewhere. It's part of the king-

dom of the dimensions, just as man and the gorilla are both a part of the animal kingdom."

Suddenly the shimmering L seemed to change. The upright arm of the figure seemed to squirm and the lower bar seemed to writhe. Then the iridescence seemed to grow and flow outward like a cloud, enveloping Gideon from head to foot. I darted forward, and tried to reach the instrument panel, but something seemed to bar my path. That emanation was as solid as a brick wall.

While I was still scream-

ing, Gideon reappeared. His face was covered with sweat, and he seemed to have difficulty breathing. "You know, Joe," he said, when he caught his breath, "maybe there's no such thing as time travel, but there's certainly going to be such a thing as travel in hyperspace!"

I knew what he was talking about. "Did you see her?"

"I certainly did! And she's got a machine like mine; I'm going back there someday."

You don't have to believe this. I'm only staking my mathematical reputation on it.



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