

# *The Billiard Ball*

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Illustrated by BODE

I

**J**ames Priss — I suppose I ought to say Professor James Priss, though everyone is sure to know who I mean even without the title — always spoke slowly.

I know. I interviewed him often enough. He had the greatest mind since Einstein, but it didn't work quickly. He admitted his slowness

often. Maybe it was *because* he had so great a mind that it didn't work quickly.

He would say something in slow abstraction, then he would think, and then he would say something more. Even over trivial matters, his giant mind would hover uncertainly, adding a touch here and then another there.

*Would* the sun rise tomorrow, I

can imagine him wondering. What do we mean by "rise"? Can we be certain that tomorrow will come? Is the term "sun" completely unambiguous in this connection?

Add to this habit of speech a bland countenance, rather pale, with no expression except for a general look of uncertainty; gray hair, rather thin, neatly combed; business suits of an invariably conservative cut; and you have what Professor James Priss was — a retiring person, completely lacking in magnetism.

That's why nobody in the world, except myself, could possibly suspect him of being a murderer. And even I am not sure. After all, he *was* slow-thinking; he was *always* slow-thinking. Is it conceivable that at one crucial moment, he managed to think quickly and act at once?

It doesn't matter. Even if he murdered, he got away with it. It is far too late now to try to reverse matters, and I wouldn't succeed in doing so even if I decided to let this be published.

Edward Bloom was Priss's classmate in college, and an associate through circumstance for a generation afterward. They were equal in age and in their propensity for the bachelor life, but opposites in everything else that mattered.

Bloom was a living flash of light; colorful, tall, broad, loud, brash and self-confident. He had a mind that resembled a meteor-strike in the sudden and unexpected way it could seize the essential. He was no theoretician, as Priss was; Bloom had neither the patience for it, nor the

capacity to concentrate intense thought upon a single abstract point. He admitted that. He boasted of it.

What he did have was an uncanny way of seeing the application of a theory, of seeing the manner in which it could be put to use. In the cold marble block of abstract structure, he could see, without apparent difficulty, the intricate design of a marvelous device. The block would fall apart at his touch and leave the device.

It is a well known story, and not too badly exaggerated at that, that nothing Bloom ever built had failed to work, or to be patentable, or to be profitable. By the time he was 45, he was one of the richest men on Earth.

And if Bloom the Technician were adapted to one particular matter more than anything else, it was to the way of thought of Priss the Theoretician. Bloom's greatest gadgets were built upon Priss's greatest thoughts, and as Bloom grew wealthy and famous, Priss gained phenomenal respect among his colleagues.

Naturally, it was to be expected that when Priss advanced his Two-Field Theory, Bloom would set about at once to build the first practical anti-gravity device.

## II

My job was to find human interest in the Two-Field Theory for the subscribers to Tele-News Press, and you get that by trying to deal with human beings and not with abstract ideas. Since my inter-

viewee was Professor Priss, that wasn't easy.

Naturally, I was going to ask about the possibilities of anti-gravity, which interested everyone; and not about the Two-Field Theory, which no one could understand.

"Anti-gravity?" Priss compressed his pale lips and considered. "I'm not entirely sure that it is possible. Or ever will be. I haven't — uh — worked the matter out to my satisfaction. I don't entirely see whether the Two-Field equations would have a finite solution, which they would have to have, of course, if —" And then he went off into a brown study.

I prodded him. "Bloom says he thinks such a device can be built."

Priss nodded. "Well, yes, but I wonder. Ed Bloom has had an amazing knack at seeing the unobvious in the past. He has an unusual mind. It's certainly made him rich enough."

We were sitting in Priss's apartment. Ordinary middle-class. I couldn't help a quick glance this way and that. Priss was not wealthy.

I don't think he read my mind. He saw me look. And I think it was on *his* mind. He said, "Wealth isn't the usual reward for the pure scientist. Or even a particularly desirable one."

Maybe so, at that, I thought. Priss certainly had his own kind of reward. He was the third person in history to win two Nobel Prizes; and the first to have both of them in the sciences and both of them unshared. You can't complain about that. And if he wasn't rich, neither was he poor.

But he didn't sound like a con-

tented man. Maybe it wasn't Bloom's wealth alone that irked Priss. Maybe it was Bloom's fame among the people of Earth generally; maybe it was the fact that Bloom was a celebrity wherever he went, whereas Priss, outside scientific conventions and faculty clubs, was largely anonymous.

I can't say how much of all this was in my eyes or in the way I wrinkled the creases in my forehead, but Priss went on to say, "But we're friends, you know. We play billiards once or twice a week. I beat him regularly."

(I never published that statement. I checked it with Bloom, who made a long counter-statement that began: "He beat *me* at billiards. That jackass — " and grew increasingly personal thereafter. As a matter of fact, neither one was a novice at billiards. I watched them play once for a short while, after the statement and counter-statement, and both handled the cue with professional aplomb. What's more, both played for blood, and there was no friendship in the game that I could see.)

I said, "Would you care to predict whether Bloom will manage to build an anti-gravity device?"

"You mean would I commit myself to anything? Hmm. Well, let's consider, young man. Just what do we mean by anti-gravity? Our conception of gravity is built around Einstein's General Theory of Relativity, which is now a century and a half old but which, within its limits, remains firm. We can picture it — "

I listened politely. I'd heard Priss

on the subject before, but if I was to get anything out of him — which wasn't certain — I'd have to let him work his way through in his own way.

"We can picture it," he said, "by imagining the universe to be a flat, thin, super-flexible sheet of untearable rubber. If we picture mass as being associated with weight, as it is on the surface of the Earth, then we would expect a mass, resting upon the rubber sheet, to make an indentation. The greater the mass, the deeper the indentation.

"In the actual universe," he went on, "all sorts of masses exist, and so our rubber sheet must be pictured as riddled with indentations. Any object rolling along the sheet would dip into and out of the indentations it passed, veering and changing direction as it did so. It is this veer and change of direction that we interpret as demonstrating the existence of a force of gravity. If the moving object comes close enough to the center of the indentation and is moving slowly enough, it gets trapped and whirls round and round that indentation. In the absence of friction, it keeps up that whirl forever. In other words, what Isaac Newton interpreted as a force, Albert Einstein interpreted as geometrical distortion."

He paused at this point. He had been speaking fairly fluently — for him — since he was saying something he had said often before. But now he began to pick his way.

He said, "So in trying to produce anti-gravity, we are trying to alter the geometry of the universe. If we

carry on our metaphor, we are trying to straighten out the indented rubber sheet. We could imagine ourselves getting under the indenting mass and lifting it upward, supporting it so as to prevent it from making an indentation. If we make the rubber sheet flat in that way, then we create a universe — or at least a portion of the universe — in which gravity doesn't exist. A rolling body would pass the non-indenting mass without altering its direction of travel a bit, and we could interpret this as meaning that the mass was exerting no gravitational force. In order to accomplish this feat, however, we need a mass equivalent to the indenting mass. To produce anti-gravity on Earth in this way, we would have to make use of a mass equal to that of Earth and poise it above our heads, so to speak."

I interrupted him. "But your Two-Field Theory — "

"Exactly. General Relativity does not explain both the gravitational field and the electromagnetic field in a single set of equations. Einstein spent half his life searching for that single set — for a Unified Field Theory — and failed. All who followed Einstein also failed. I, however, began with the assumption that there were two fields that could not be unified and followed the consequences, which I can explain, in part, in terms of the rubber-sheet metaphor."

Now we came to something I wasn't sure I had ever heard before. "How does that go?" I asked.

"Suppose that, instead of trying to lift the indenting mass, we try to stif-



fen the sheet itself, make it less indentable. It would contract, at least over a small area, and become flatter. Gravity would weaken. And so would mass, for the two are essentially the same phenomenon in terms of the indented Universe. If we could make the rubber sheet completely flat, both gravity and mass would disappear altogether.

"Under the proper conditions, the electromagnetic field could be made to counter the gravitational field and serve to stiffen the indented fabric of the universe. The electromagnetic field is tremendously stronger than the gravitational field, so the former could be made to overcome the latter."

I said, uncertainly, "But you say 'under the proper conditions.' Can those proper conditions you speak of be achieved, Professor?"

"That is what I don't know," said Priss, thoughtfully and slowly. "If the universe were really a rubber sheet, its stiffness would have to reach an infinite value before it could be expected to remain completely flat under an indenting mass. If that is also so in the real universe, then an infinitely intense electromagnetic field would be required, and that would mean anti-gravity would be impossible."

"But Bloom says —"

"Yes, I imagine Bloom thinks a finite field will do, if it can be properly applied. Still, however ingenious he is," and Priss smiled narrowly, "we needn't take him to be infallible. His grasp on theory is quite faulty. He — he never earned his college degree, did you know that?"

I was about to say that I knew that. After all, everyone did. But there was a touch of eagerness in Priss's voice as he said it, and I looked up in time to catch animation in his eye, as though he were delighted to spread that piece of news. So I nodded my head as if I were filing it for future reference.

"Then you would say, Professor Priss," I prodded again, "that Bloom is probably wrong and that anti-gravity is impossible?"

And finally Priss nodded and said, "The gravitational field can be weakened, of course, but if by anti-gravity we mean a true zero-gravity field — no gravity at all over a significant volume of space — then I suspect anti-gravity may turn out to be impossible, despite Bloom."

And I rather had what I wanted.

### III

I wasn't able to see Bloom for nearly three months after that, and when I did see him he was in an angry mood.

He had grown angry at once, of course, when the news first broke concerning Priss's statement. He let it be known that Priss would be invited to the eventual display of the anti-gravity device as soon as it was constructed and would even be asked to participate in the demonstration.

Some reporter (not me, unfortunately) caught him between appointments and asked him to elaborate on that, and he said:

"I'll have the device eventually; soon, maybe. And you can be there,



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and so can anyone else the press would care to have there. And Professor James Priss can be there. He can represent Theoretical Science, and after I have demonstrated anti-gravity, he can adjust his theory to explain it. I'm sure he will know how to make his adjustments in masterly fashion and show exactly why I couldn't possibly have failed. He might do it now and save time, but I suppose he won't."

It was all said very politely, but you could hear the snarl under the rapid flow of words.

Yet he continued his occasional game of billiards with Priss, and when the two met they behaved with complete propriety. One could tell the progress Bloom was making by their respective attitudes to the press. Bloom grew curt and even snappish, while Priss developed an increasing good humor.

When my umpteenth request for an interview with Bloom was finally accepted, I wondered if perhaps that meant a break in Bloom's quest. I had a little day-dream of him announcing final success to me.

It didn't work out that way. He met me in his office at Bloom Enterprises in upstate New York. It was a wonderful setting, well away from any populated area, elaborately landscaped, and covering as much ground as a rather large industrial establishment. Edison at his height, two centuries ago, had never been as phenomenally successful as Bloom.

But Bloom was not in a good humor. He came striding in ten minutes late and went snarling past his secretary's desk with the barest nod in

my direction. He was wearing a lab coat, unbuttoned.

He threw himself into his chair and said, "I'm sorry if I've kept you waiting, but I didn't have as much time as I had hoped." Bloom was a born showman and knew better than to antagonize the press, but I had the feeling he was having a great deal of difficulty at that moment in adhering to this principle.

I made the obvious guess. "I am given to understand, sir, that your recent tests have been unsuccessful."

"Who told you that?"

"I would say it was general knowledge, Mr. Bloom."

"No, it isn't. Don't say that, young man! There is no general knowledge about what goes on in my laboratories and workshops. You're stating the professor's opinions, aren't you?"

"No, I'm —"

"Of course you are! Aren't you the one to whom he made that statement — that anti-gravity is impossible?"

"He didn't make the statement that flatly."

"He never says anything flatly. But it was flat enough for him. And not as flat as I'll have his damned rubber-sheet universe before I'm finished."

"Then does that mean you're making progress, Mr. Bloom?"

"You know I am," he said with a snap. "Or you should know. Weren't you there at the demonstration last week?"

"Yes, I was."

I judged Bloom to be in trouble, or he wouldn't be mentioning that demonstration. It worked, but it was

not a world beater. Between the two poles of a magnet a region of lessened gravity was produced.

**I**t was done very cleverly. A Mossbauer Effect Balance was used to probe the space between the poles. If you've never seen an M-E Balance in action, it consists primarily of a tight monochromatic beam of gamma rays shot down the low-gravity field. The gamma rays change wavelength slightly but measurably under the influence of the gravitational field and if anything happens to alter the intensity of the field, the wavelength-change shifts correspondingly. It is an extremely delicate method for probing a gravitational field, and it worked like a charm. There was no question but that Bloom had lowered gravity.

The trouble was that it had been done before by others. Bloom, to be sure, had made use of circuits that greatly increased the ease with which such an effect had been achieved (his system was typically ingenious and had been duly patented), and he maintained that it was by this method that anti-gravity would become not merely a scientific curiosity but a practical affair with industrial applications.

Perhaps! But it was an incomplete job, and he didn't usually make a fuss over incompleteness. He wouldn't have done so this time if he didn't have to display *something*.

I said, "It's my impression that what you accomplished at that preliminary demonstration was 0.82 g, and better than that was achieved in Brazil last spring."

"That so? Well, calculate the energy input in Brazil and here and then tell me the difference in gravity decrease per kilowatt-hour. You'll be surprised."

"But the point is, can you reach 0 g; zero gravity? That's what Professor Priss thinks may be impossible. Everyone agrees that merely lessening the intensity of the field is no great feat."

Bloom's fist clenched. I had the feeling that a key experiment had gone wrong that day and he was annoyed almost past endurance. Bloom hated to be balked by the universe.

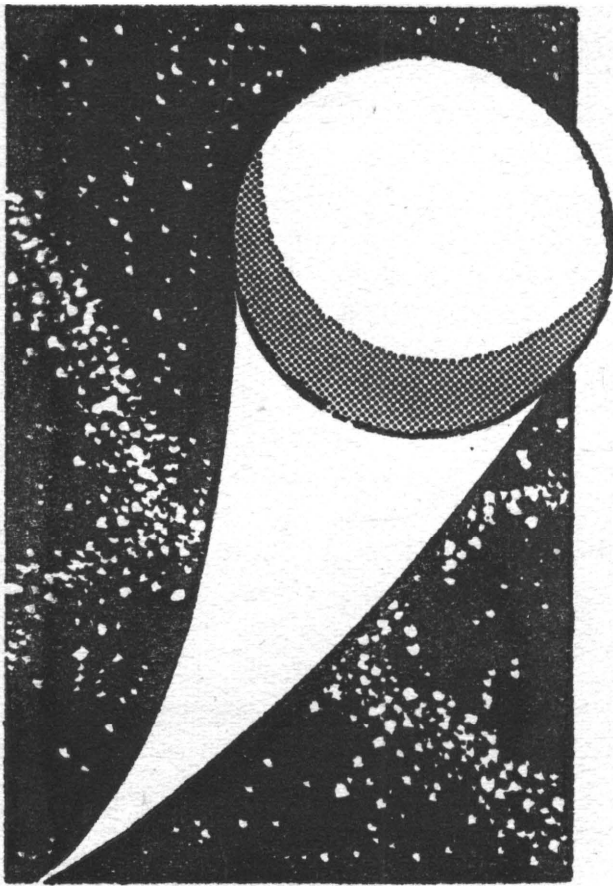
He said, "Theoreticians make me sick." He said it in a low, controlled voice, as though he were finally tired of not saying it, and he was going to speak his mind and be damned. "Priss has won two Nobel Prizes for sloshing around a few equations, but what has he done with it? Nothing! I *have* done something with it and I'm going to do more with it, whether Priss likes it or not.

"*I'm* the one people will remember. *I'm* the one who gets the credit. He can keep his damned title and his Prizes and his kudos from the scholars. Listen, I'll tell you what gripes him. Plain old-fashioned jealousy. It kills him that I get what I get for doing. He wants it for *thinking*.

"I said to him once — We play billiards together, you know —"

(It was at this point that I quoted Priss's statement about billiards and got Bloom's counterstatement. I never published either. That was just trivia.)

"We play billiards," said Bloom,



when he had cooled down, "and I've won my share of games. We keep things friendly enough, what the hell — college chums and all that — though how he got through I'll never know. He made it in physics, of course, and in math. But he got a bare pass — out of pity, I think — in every humanities course he ever took."

"You did not get your degree, did you, Mr. Bloom?" (That was sheer mischief on my part. I was enjoying his eruption.)

"I quit to go into business, damn it! My academic average, over the three years I attended, was a strong B. Don't imagine anything else, you hear? Hell, by the time Priss got his Ph.D., I was working on my second million."

He went on, clearly irritated.

"Anyway, we were playing billiards, and I said to him, 'Jim, the average man will never understand why you get the Nobel Prize when I'm the one who gets the results. Why do you need two? Give me one!' He stood there, chalking up his cue, and then he said in his soft namby-pamby way, 'You have two billion, Ed. Give me one.' So you see, he wants the money."

I said, "I take it you don't mind his getting the honor?"

For a minute, I thought he was going to order me out. But he didn't. He laughed instead, waved his hand in front of him, as though he were erasing something from an invisible blackboard in front of him. He said, "Oh, well, forget it. All that is off the record. Listen, do you want a statement? Okay! Things didn't go right today, and I blew my top a bit, but it will clear up. I think I know what's wrong. And if I don't, I'm going to know."

"Look, you can say that *I* say that we *don't* need infinite electromagnetic intensity. We *will* flatten out the rubber sheet. We *will* have zero gravity. And when we get it, I'll have the damndest demonstration you ever saw, exclusively for the press and for Priss, and you'll be invited. And you can say it won't be long. Okay?"

Okay!

I had time after that to see each man once or twice more. I even saw them together when I was present at one of their billiard games. As I said before, both of them were good.



But the call to the demonstration did not come as quickly as all that. It arrived six weeks less than a year after Bloom gave me his statement.

And at that, perhaps it was unfair to expect quicker work.

I had a special engraved invitation, with the assurance of a cocktail hour first. Bloom never did things by halves, and he was planning to have a pleased and satisfied group of reporters on hand. There was an arrangement for tridimensional TV, too. Bloom felt completely confident, obviously; confident enough to be willing to trust the demonstration in every living room on the planet.

I called up Professor Priss, to make sure he was invited, too. He was!

"Do you plan to attend, sir?"

There was a pause, and the professor's face on the screen was a study in uncertain reluctance. "A demonstration of this sort is most unsuitable where a serious scientific matter is in question. I do not like to encourage such things."

I was afraid he would beg off, and the dramatics of the situation would be greatly lessened if he were not there. But then, perhaps, he decided he dared not play the chicken before the world. With obvious distaste, he said, "Of course, Ed Bloom is not really a scientist, and he must have his day in the sun. I'll be there."

"Do you think Mr. Bloom can produce zero gravity, sir?"

"— uh — Mr. Bloom sent me a copy of the design of his device and — and I'm not certain. Perhaps he can do it, if — uh — he says he can do it. Of course — " he paused

again for quite a long time. "I think I would like to see it."

So would I, and so would many others.

The staging was impeccable. A whole floor of the main building at Bloom Enterprises — the one on the hilltop — was cleared. There were the promised cocktails and a splendid array of hors d'oeuvres, soft music and lighting, and a carefully dressed and thoroughly jovial Edward Bloom playing the perfect host, while a number of polite and unobtrusive menials fetched and carried. All was geniality and amazing confidence.

James Priss was late, and I caught Bloom watching the corners of the crowd and beginning to grow a little grim about the edges. Then Priss arrived, dragging a volume of color-



Professor James Priss

lessness in with him, a drabness that was unaffected by the noise and the absolute splendor (no other word would describe it — or else it was the two martinis glowing inside me) that filled the room.

Bloom saw him, and his face was illuminated at once. He bounced across the floor, seizing the smaller man's hand and dragging him to the bar.

"Jim! Glad to see you! What'll you have? Hell, man, I'd have called it off if you hadn't showed. Can't have this thing without the star, you know." He wrung Priss's hand. "It's your theory, you know. We poor mortals can't do a thing without you few, you damned *few* few, pointing the way."

He was being ebullient, handing out the flattery, because he could afford to do so now. He was fattening Priss for the kill.

Priss tried to refuse a drink, with some sort of mutter, but a glass was pressed into his hand; and Bloom raised his voice to a bullroar.

"Gentlemen! A moment's quiet, please. To Professor Priss, the greatest mind since Einstein, two-time Nobel Laureate, father of the Two-Field Theory, and inspirer of the demonstration we are about to see—even if he didn't think it would work and he had the guts to say so publicly."

There was a distinct titter of laughter that quickly faded out, and Priss looked as grim as he could manage.

"But now that Professor Priss is here," said Bloom, "and we've had our toast, let's get on with it. Follow me, gentlemen!"

## IV

The demonstration was in a much more elaborate place than had housed the earlier one. This time it was on the top floor of the building. Different magnets were involved — smaller ones, by heaven — but as nearly as I could tell, the same M-E Balance was in place.

One thing was new, however, and it staggered everybody, drawing much more attention than anything else in the room. It was a billiard table, resting under one pole of the magnet. Beneath it was the companion pole. A round hole about a foot across was stamped out of the very center of the table; and it was obvious that the zero-gravity field, if it was to be produced, would be produced through that hole in the center of the billiard table.

It was as though the whole demonstration had been designed, surrealist-fashion, to point up the victory of Bloom over Priss. This was to be another version of their everlasting billiards competition, and Bloom was going to win.

I don't know if the other newsmen took matters in that fashion, but I think Priss did. I turned to look at him and saw that he was still holding the drink that had been forced into his hand. He rarely drank, I knew, but now he lifted the glass to his lips and emptied it in two swallows. He stared at that billiard ball, and I needed no gift of ESP to realize that he took it as a deliberate snap of fingers under his nose.

Bloom led us to the twenty seats that surrounded three sides of the

table, leaving the fourth free as a working area. Priss was carefully escorted to the seat commanding the most convenient view. Priss glanced quickly at the tri-di cameras which were now working. I wondered if he were thinking of leaving but deciding that he couldn't in the full glare of the eyes of the world.

Essentially, the demonstration was simple; it was the production that counted. There were dials in plain view that measured the energy expenditure. There were others that transferred the M-E Balance readings into a position and a size that were visible to all. Everything was arranged for easy tri-di viewing.

Bloom explained each step in a genial way, with one or two pauses in which he turned to Priss for a confirmation that had to come. He didn't do it often enough to make it obvious, but just enough to turn Priss upon the spit of his own torment. From where I sat I could look across the table and see Priss on the other side.

He had the look of a man in Hell.

As we all know, Bloom succeeded. The M-E Balance showed the gravitational intensity to be sinking steadily as the electromagnetic field was intensified. There were cheers, when it dropped below the 0.52 g mark. A red line indicated that on the dial.

"The 0.52 g mark, as you know," said Bloom, confidently, "represents the previous record low in gravitational intensity. We are now lower than that at a cost in electricity that is less than ten per cent what it cost

at the time that mark was set. And we will go lower still."

Bloom (I think deliberately, for the sake of the suspense) slowed the drop toward the end, letting the tri-di cameras switch back and forth between the gap in the billiard table and the dial on which the M-E Balance reading was lowering.

Bloom said, suddenly, "Gentlemen, you will find dark goggles in the pouch on the side of each chair. Please put them on now. The zero-gravity field will soon be established, and it will radiate a light rich in ultraviolet."

He put goggles on himself, and there was a momentary rustle as others went on, too.

I think no one breathed during the last minute, when the dial reading dropped to zero and held fast. And just as that happened a cylinder of light sprang into existence from pole to pole through the hole in the billiard table.

There was a ghost of twenty sighs at that. Someone called out, "Mr. Bloom, what is the reason for the light?"

"It's characteristic of the zero-gravity field," said Bloom smoothly, which was no answer of course.

Reporters were standing up now, crowding about the edge of the table. Bloom waved them back. "Please, gentlemen, stand clear!"

Only Priss remained sitting. He seemed lost in thought, and I have been certain ever since that it was the goggles that obscured the possible significance of everything that followed. I didn't see his eyes. I couldn't. And that meant neither I



nor anyone else could even begin to make a guess as to what was going on behind those eyes.

Well, maybe we couldn't have made such a guess, even if the goggles hadn't been there, but who can say?

Bloom was raising his voice again. "Please! The demonstration is not yet over. So far, we've only repeated what I have done before. I have now produced a zero-gravity field and I have shown it can be done practically. But I want to demonstrate something of what such a field can do. What we are going to see next will be something that has never been seen, not even by myself. I have not experimented in this direction, much as I would have liked to, because I have felt that Professor Priss deserved the honor of — "

Priss looked up sharply, "What — what — "

"Professor Priss," said Bloom, smiling broadly, "I would like you to perform the first experiment involving the interaction of a solid object with a zero-gravity field. Notice that the field has been formed in the center of a billiard table. The world knows your phenomenal skill in billiards, Professor, a talent second only to your amazing aptitude in theoretical physics. Won't you send a billiard ball into the zero-gravity volume?"

Eagerly, he was handing a ball and cue to the professor. Priss, his eyes hidden by the goggles, stared at them and only very slowly, very uncertainly, reached out to take them.

I wonder what his eyes were show-

ing. I wonder, too, how much of the decision to have Priss play billiards at the demonstration was due to Bloom's anger at Priss's remark about their periodic game, the remark I had quoted. Had I been, in my way, responsible for what followed?

"Come, stand up, Professor," said Bloom, "and let me have your seat. The show is yours from now on. Go ahead!"

Bloom seated himself and still talked, in a voice that grew more organlike with each moment. "Once Professor Priss sends the ball into the volume of zero-gravity, it will no longer be affected by Earth's gravitational field. It will remain truly motionless while the Earth rotates about its axis and travels about the sun. In this latitude, and at this time of day, I have calculated that the Earth, in its motions, will sink downward. We will move with it, and the ball will stand still. To us it will seem to rise up and away from the Earth's surface. Watch."

Priss seemed to stand in front of the table in frozen paralysis. Was it surprise? Astonishment? I don't know. I'll never know. Did he make a move to interrupt Bloom's little speech, or was he just suffering from an agonized reluctance to play the ignominious part into which he was being forced by his adversary?

Priss turned to the billiard table, looking first at it, then back at Bloom. Every reporter was on his feet, crowding as closely as possible in order to get a good view. Only Bloom himself remained seated, smiling and isolated. (He, of course, was

not watching the table, or the balls, or the zero-gravity field. As nearly as I could tell through the goggles, he was watching Priss.)

Priss turned to the table and placed his ball. He was going to be the agent that was to bring final and dramatic triumph to Bloom and make himself — the man who said it couldn't be done — the goat to be mocked forever.

Perhaps he felt there was no way out. Or perhaps —

With a sure stroke of his cue, he set the ball into motion. It was not going quickly, and every eye followed it. It struck the side of the table and caromed. It was going even slower now as though Priss himself were increasing the suspense and making Bloom's triumph the more dramatic.

I had a perfect view, for I was standing on the side of the table opposite from that where Priss was. I could see the ball moving toward the glitter of the zero-gravity field, and beyond it I could see those portions of the seated Bloom which were not hidden by that glitter.

The ball approached the zero-gravity volume, seemed to hang on the edge for a moment and then was gone, with a streak of light, the sound of a thunder-clap and the sudden smell of burning cloth.

We yelled. We all yelled.

I've seen the scene on television since — along with the rest of the world. I can see myself in the film during that fifteen second period of wild confusion, but I don't really recognize my face.

Fifteen seconds!

And then we discovered Bloom. He was still sitting in the chair, his arms still folded — but there was a hole the size of a billiard ball through left wrist, chest and back. The better part of his heart, as it later turned out under autopsy, had been neatly punched out.

They turned off the device. They called in the police. They dragged off Priss, who was in a state of utter collapse. I wasn't much better off, to tell the truth, and if any reporter then on the scene ever tried to say he remained a cool observer of that scene, then he's a cool liar.

## V

It was some months before I got to see Priss again. He had lost some weight but seemed well otherwise. Indeed, there was color in his cheeks and an air of decision about him. He was better dressed than I had ever seen him to be.

He said, "I know what happened now. If I had had time to think, I would have known then. But I am a slow thinker, and poor Ed Bloom was so intent on running a great show and doing it so well that he carried me along with him. Naturally, I've been trying to make up for some of the damage I unwittingly caused."

"You can't bring Bloom back to life," I said, soberly.

"No, I can't," he said, just as soberly. "But there's Bloom Enterprises to think of, too. What happened at the demonstration, in full view of the world, was the worst possible advertisement for zero-gravity, and it's important that the story

be made clear. That is why *I* have asked to see *you*."

"Yes?"

"If I had been a quicker thinker, I would have known Ed was speaking the purest nonsense, when he said that the billiard ball would slowly rise in the zero-gravity field. It *couldn't* be so! If Bloom hadn't despised theory so, if he hadn't been so intent on being proud of his own ignorance of theory, he'd have known it himself.

"The Earth's motion, after all, isn't the only motion involved, young man. The sun itself moves in a vast orbit about the center of the Milky Way galaxy. And the galaxy moves, too, in some not very clearly defined way. If the billiard ball were subjected to zero gravity, you might think of it as being unaffected by any of these motions and therefore of suddenly falling into a state of absolute rest — when there is no such thing as absolute rest."

Priss shook his head slowly. "The trouble with Ed, I think, was that he was thinking of the kind of zero-gravity one gets in a spaceship in free fall, when people float in mid-air. He expected the ball to float in mid-air. However, in a spaceship, zero gravity is not the result of an absence of gravitation, but merely the result of two objects, a ship and a man within the ship, falling at the same rate, responding to gravity in precisely the same way, so that each is motionless with respect to the other.

"In the zero-gravity field produced by Ed, there was a flattening of the rubber-sheet universe, which

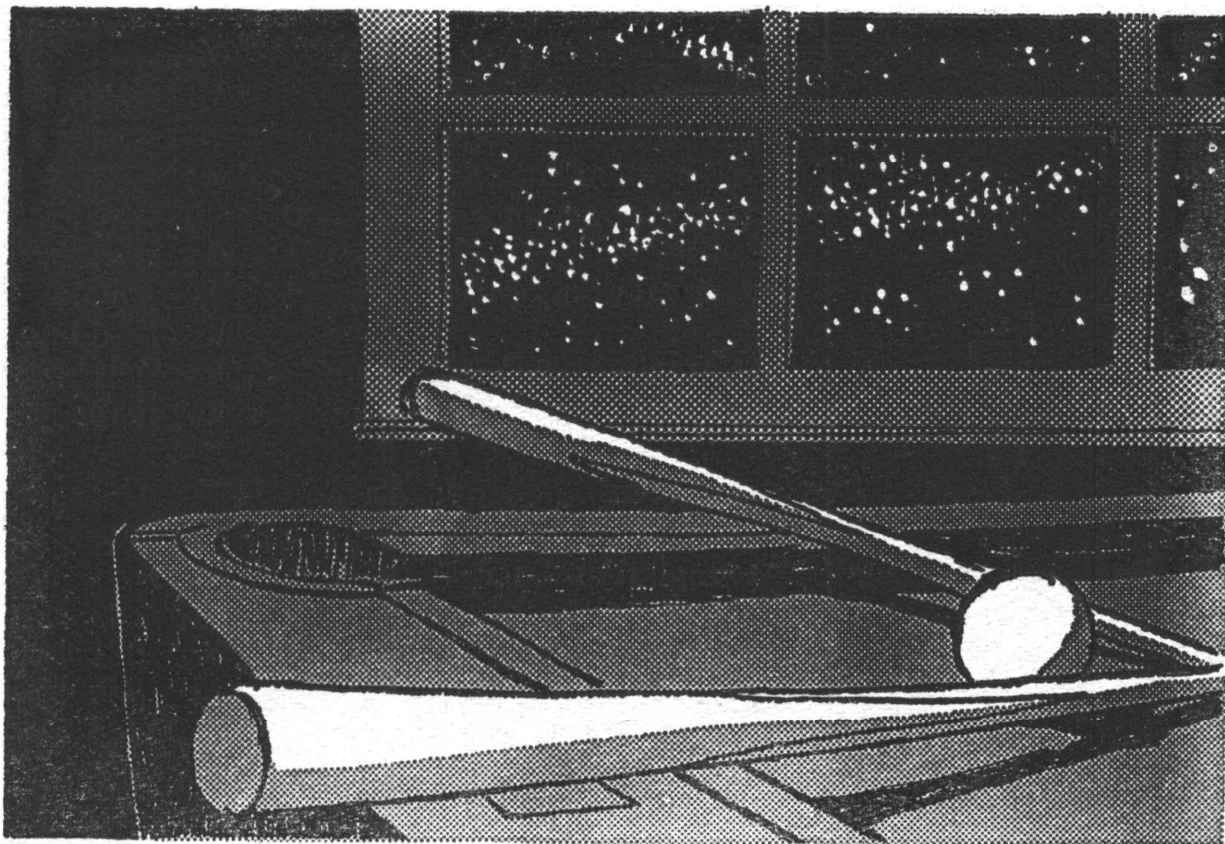
means an actual loss of mass. Everything in that field, including molecules of air caught within it, and the billiard ball I pushed into it, was completely massless as long as it remained with it. A completely massless object can move in only one way."

He paused, inviting the question. I asked, "What motion would that be?"

"Motion at the speed of light. Any massless object, such as a neutrino or a photon, must travel at the speed of light as long as it exists. In fact, light moves at that speed only because it is made up of photons. As soon as the billiard ball entered the zero-gravity field and lost its mass, it, too, assumed the speed of light at once and left."

I shook my head. "But didn't it regain its mass as soon as it left the zero-gravity volume?"

"It certainly did, and at once it began to be affected by the gravitational field and to slow up in response to the friction of the air and the top of the billiard table. But imagine how much friction it would take to slow up an object the mass of a billiard ball going at the speed of light. It went through the hundred-mile thickness of our atmosphere in a thousandth of a second, and I doubt that it was slowed more than a few miles a second in doing so; a few miles out of 186,282 of them. On the way, it scorched the top of the billiard table, broke cleanly through the edge, went through poor Ed and the window too, punching out neat circles, because it had passed



through before the neighboring portions of something even as brittle as glass had a chance to split and splinter.

"It is extremely fortunate we were on the top floor of a building set in a countrified area. If we were in the city, it might have passed through a number of buildings and killed a number of people. By now that billiard ball is off in space, far beyond the edge of the solar system, and it will continue to travel so forever, at nearly the speed of light, until it happens to strike an object large enough to stop it. And it will then gouge out a sizable crater."

I played with the notion and was not sure I liked it. "How is that possible? The billiard ball entered the zero-gravity volume almost at a standstill. I saw it. And you say it

left with an incredible quantity of kinetic energy. Where did the energy come from?"

Priss shrugged. "It came from nowhere! The law of conservation of energy only holds under the conditions in which general relativity is valid; that is, in an indented rubber-sheet universe. Wherever the indentation is flattened out, general relativity no longer holds, and energy can be created and destroyed freely. That accounts for the radiation along the cylindrical surface of the zero-gravity volume. That radiation, you remember, Bloom did not explain, and, I fear, could not explain. If he had only experimented further first; if he had only not been so foolishly anxious to put on his show — "

"What accounts for the radiation, sir?"

"The molecules of air inside the volume! Each assumes the speed of light and comes smashing outward. They're only molecules, not billiard balls, so they're stopped, but the kinetic energy of their motion is converted into energetic radiation. It's continuous because new molecules are always drifting in and attaining the speed of light and smashing out."

"Then energy is being created continuously?"

"Exactly. And that is what we must make clear to the public. Anti-gravity is not primarily a device to lift spaceships or to revolutionize mechanical movement. Rather it is the source of an endless supply of free energy, since part of the energy produced can be diverted to maintain the field that keeps that portion of the universe flat. What Ed Bloom invented, without knowing it, was not just anti-gravity, but the first successful perpetual motion machine of the first class — one that manufactures energy out of nothing."

I said, slowly, "Any one of us could have been killed by that billiard ball, is that right, professor? It might have come out in any direction."

Priss said, "Well, massless photons emerge from any light source at the speed of light in any direction; that's why a candle casts light in all directions. The massless air molecules come out of the zero-gravity volume in all directions, which is why the entire cylinder radiates. But the billiard ball was only one object. It could have come out in any direction, but it had to come out in some one direction, chosen at random, and

the chosen direction happened to be the one that caught Ed."

That was it. Everyone knows the consequences. Mankind had free energy and so we have the world we have now. Professor Priss was placed in charge of its development by the board of Bloom Enterprises, and in time he was as rich and famous as ever Edward Bloom had been. And Priss still has two Nobel Prizes in addition.

Only —

I keep thinking. Photons smash out from a light source in all directions because they are created at the moment and there is no reason for them to move in one direction more than in another. Air molecules come out of a zero-gravity field in all directions because they enter it in all directions.

But what about a single billiard ball, entering a zero-gravity field from one particular direction. Does it come out in the same direction or in any direction?

I've inquired delicately, but theoretical physicists don't seem to be sure, and I can find no record that Bloom Enterprises, which is the only organization working with zero-gravity fields, has ever experimented in the matter. Someone at the organization once told me that the uncertainty principle guarantees the random emergence of an object entering in any direction. But then why don't they try the experiment?

Could it be, then —

Could it be that for once Priss's mind had been working quickly? Could it be that, under the pressure

of what Bloom was trying to do to him, Priss had suddenly seen everything. He had been studying the radiation surrounding the zero-gravity volume. He might have realized its cause and been certain of the speed-of-light motion of anything entering the volume.

Why, then, had he said nothing?

One thing is certain. *Nothing* Priss would do at the billiard table could be accidental. He was an expert and the billiard balls did exactly what he wanted them to. I was standing right there. I saw him look at

Bloom and then at the table as though he were judging angles.

I watched him hit that ball. I watched it bounce off the side of the table and move into the zero-gravity volume, heading in one particular direction.

For when Priss sent that ball toward the zero-gravity volume — and the tri-di films bear me out — it was *already* aimed directly at Bloom's heart!

Accident? Coincidence?

Murder?

END

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