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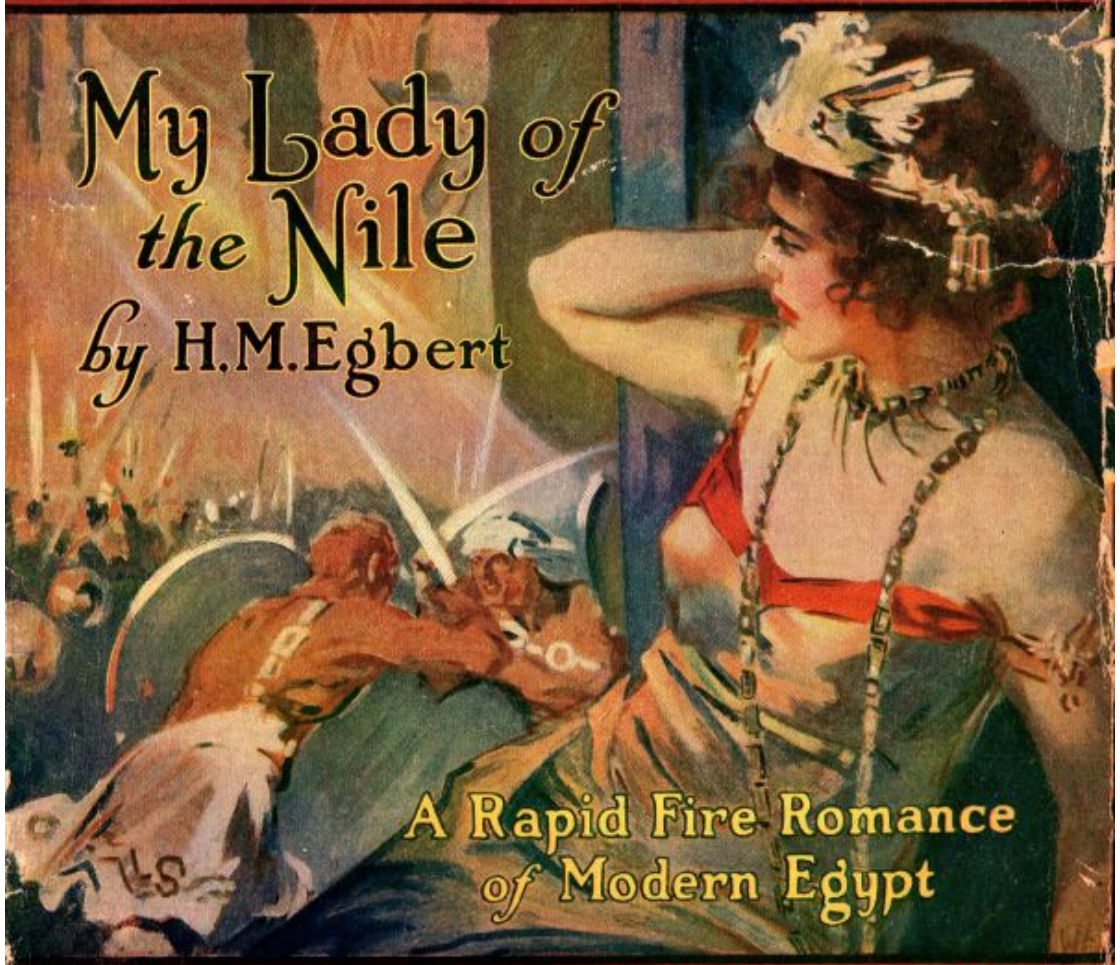

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The Gravity Professor

by
Ray Cummings

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I.

Tubby shoved his plate away from him with dignity and threw his napkin on the table.

"That ain't so," he declared, glaring at his friend aggressively. "And furthermore, and in addition, I say—"

"I ain't interested in what you say; I'm telling you what *he* said. 'If you're heavier than water you sink—if you're lighter you float.' That's what he said."

"You're right, Jake," agreed the second man. "That's what he said."

"Well, it ain't so. And furthermore, I can prove it."

They sat in the corner of a small, side-street restaurant off Longacre Square. Tubby raised his voice above the whine of the little jazz orchestra and the shuffling feet of the dancers.

" 'Tain't so," he repeated. "And I can prove it—if you're interested." His tone was scornful and infinitely sarcastic.

"He says he can prove it, Jake," elucidated the second man.

The first man sighed wearily. "Go ahead and prove it," he said.

"What you said," Tubby began, "was that if you're heavier than water you sink, and if you're lighter, you float. Ain't I right?"

"I *didn't* say it. I said *he* said it. That's different."

"You're right, Jake. *You* didn't say it," concurred the second man.

Tubby gulped. "Well, anyway—you said *he* said it. And 'tain't so." He paused impressively. "Can you swim?" he added suddenly. He shoved his chubby little forefinger directly under the first man's nose.

"Huh?" said the first man, surprised.

“I said ‘can you swim?’ Can you, or can’t you? That’s all I want to know.”

“No,” the first man admitted. “I can’t swim.”

“Then if you got thrown in the river you’d sink, wouldn’t you?”

The first man considered. “I ain’t never been thrown in no river,” he declared finally.

“But if you did? Ain’t I got a right to ask you a hypothetical question? If you did—” He paused again.

“I guess maybe I’d sink,” the first man admitted.

Tubby smiled with gratification. “Yes, maybe you’d sink. And how much do you weigh?”

The first man’s huge Adam’s apple bobbed up and down his stringy neck under this cross-examination.

“I—I—hundred and five,” he stammered. “Maybe more. I ain’t been weighed lately.”

“*I* weigh hund’ed and ninety,” said Tubby triumphantly. “Naked—hund’ed and ninety. So I weigh more’n you, don’t I?”

“He’s right, Jake. He weighs more’n you,” said the second man.

The first man, recovering his poise, conceded this with magnanimity. “But that ain’t got nothing to do with this here argument. I said—”

“If I weigh more’n you,” Tubby pursued relentlessly, “and *you* sink—why is it I float? *That’s* what I’m askin’. That’s a fair question, ain’t it? There’s somethin’ wrong somewhere. Ain’t I right?”

“He’s right, Jake,” said the second man.

The first man rose to his feet. “I’m only tellin’ yer what *he* said—I ain’t sayin’ what *I* think.” He looked at his watch. “Come on. We’ll be late for this here lecture if we don’t hurry.”

“I ain’t goin’ to no lecture,” declared Tubby. “I’m sleepy. I’m goin’ home.”

“We got free tickets,” urged the first man. “Come on.”

“Come on,” said the second man. “We got free tickets.”

And Tubby reluctantly went.

II.

The little hall was crowded when they took their seats. A huge rectangle of white sheet hung before them.

"It's a steopican lecture," explained the first man. "They're goin' to shine pictures on that sheet. It's a scientific lecture."

"I ain't interested in no lecture," Tubby declared again. "I wish I was home."

The lights dimmed suddenly. A hush came over the chattering little audience. A man appeared on the platform and began haranguing them in a dull, hopeless monotone.

Tubby wished again, fervently in his heart, that he were home in bed. The hard little wooden seat into which he had wedged himself was too small. He slid lower on his spine, but his knees bumped the back of the chair in front. An aisle ran beside him; he extended one of his legs into it.

A man, coming down the aisle from behind him, touched his elbow. Tubby looked up, startled.

"I want to see you," said the man softly. "Come outside for a minute."

Tubby saw he was a little wisp of a man—all skin and bones—with an emaciated face wrinkled by great age.

"Come outside a minute," he repeated. "I got something to see you about."

Tubby hesitated. A little air would do him good. Jake would never miss him; he'd be back before the lecture was over. He slid into the aisle and followed the stranger to the door.

In the lobby outside Tubby stopped.

"Where we goin'?" he asked. "What you got to see me about? I ain't interested in nothin'."

The little man smiled, exposing three decrepit yellow teeth behind his shriveled, bloodless lips.

"You'll be interested in this," he said. His voice was a thin, cracked treble—like a little child who was sick, Tubby thought.

The man's long frock coat and plug hat were exceedingly shabby. Tubby felt very big and prosperous by contrast.

"Right," he said briskly.

"Not here," said the little man. "My laboratory's at the corner. We'll go there."

"Sure," said Tubby. "We'll go there. You got somethin' to show me. Ain't I right?"

The laboratory into which Tubby was ushered a few moments later was a gigantic room completely full of a variety of mechanical contrivances. Nothing was familiar to Tubby but a big pool of very black, very ominous-looking water that occupied the center, and around which the various pieces of apparatus—complicated affairs of pulleys, weights, pendulums and little incline tracks with leaden balls to roll down them—were clustered.

Tubby's host took off his hat and coat and laid them on a stool. A huge lead ball as tall as Tubby's knees stood near by. The little man looked at his watch anxiously. Then he got behind the ball and, exerting all his strength, tried to roll it forward on the floor. After a moment of ineffectual effort he stopped and stood panting before Tubby.

"You might help me," he said.

"Sure," said Tubby. He rolled the ball forward. It was an extraordinarily heavy ball; it took all his strength to move it.

"Wait! Oh, my goodness—wait!" The little man gripped his arm in terror.

Tubby stopped rolling the ball; and the little man dropped to his hands and knees on the floor. Tubby saw that the boards were marked with chalk lines like a ruler.

"You've moved it too far," wailed his host. "Quick! Move it back. Two inches—no, wait." He whipped out a magnifying glass and examined the chalk marks where the ball lay.

"One inch and a half. A little less. Roll it back!"

His agonized tone alarmed Tubby. He shoved the ball back carefully.

"There! Now—all right!" The little man stood up trembling, and mopped the sweat from his forehead with a torn black-silk handkerchief.

"We nearly did it wrong," he said, smiling weakly. He looked at his watch again, and sighed with relief. "But it's all right now. I guess the danger's past. It's all right now."

"I'm glad," said Tubby. "We're all right now, ain't we?" He paused, suddenly embarrassed. "Say, how about me and you gettin' acquainted?"

"I *beg* your pardon," said the little man contritely. "My name's Graves—Dr. Graves, P. G."

"Pleased to meet you," said Tubby, shaking hands. "Mine's Tubby. What's the P. G. for?"

"Why P. G.—Professor of Gravity," said the little man.

"Oh," said Tubby.

"Professor of Gravity," repeated his host. "I see you don't know what that means?"

"No—yes," said Tubby. "You're sad. Ain't I right?"

The professor smiled. "You will have your little joke, I see. You are a clever man."

"Yes," assented Tubby. "What did you want to see me about? Why did you roll that ball? What's a Professor of Gravity?"

The professor looked at him with undisguised admiration. "You are a precise man, too, I see. You don't forget anything."

"No," said Tubby. "What—"

"I can answer all your questions at once," said the professor. "I am a Professor of Gravity—I know all about the laws of gravitation."

"That's fine," said Tubby. "What's gravitation?"

"Gravitation? Why—why—gravitation is what makes the weight of things."

"Oh," said Tubby. "Is that what you wanted to see me about?"

"Partly," said the professor. "I've made a wonderful discovery—I've been working at it eighty-two years, ever since I was a little boy—and now it's all ready."

"Fine," said Tubby.

"And I want you to help me test it out," the professor added. "I picked you because of your extreme weight."

"Hund'ed and ninety pounds," announced Tubby proudly. "Naked."

The professor beamed. "Wonderful! Marvelous, for so short a man."

"Yes, ain't it?" said Tubby. "Why did we roll that ball?"

The professor's face clouded again with anxiety. "To save the world," he said. His voice trembled with emotion. "In seven million nine hundred thousand and two years, one month, six days, four hours, thirteen minutes, eight and one-quarter seconds, the world would have been destroyed if we had not moved that ball just where we did."

"Countin' from when?" Tubby asked anxiously.

“From eight thirty-four this evening—the moment at which you moved it,” the professor answered.

“But it won’t be destroyed because we *did* move it,” said Tubby. “That’s fine. Ain’t I right?”

The professor nodded abstractedly. After a moment a thought occurred to Tubby. He wrinkled his forehead. “Say, professor, you ain’t tellin’ me nothin’. Why did we have to roll that ball to save the world?”

“ ‘Thou canst not touch a flower without troubling of a star,’ ” the professor quoted. “You have heard that, haven’t you?”

“No,” said Tubby. “What’s that got to do with—”

“It’s a poetical quotation,” explained the professor. “It’s based on the laws of gravity. Shall I explain?”

“Yes,” said Tubby.

The professor sat down on a little stool with his feet dangling perilously over the black pool. Tubby sat beside him, a little further away from the water.

“The law of gravitation was formulated by Sir Isaac Newton,” the professor began. “He saw an apple fall, and worked it out from that.”

“He must ’a’ been a clever guy,” said Tubby.

“Yes,” answered the professor. “Here it is: ‘Everybody in the universe attracts every other body with a force that varies directly as the mass and inversely as the square of the distance.’ ”

“Ah,” said Tubby.

“That means,” the professor went on enthusiastically, “that if an object—a person—or a world, is twice as big, it exerts twice as much force—that’s ‘directly as the mass.’ Do you see?”

“Yes—no,” said Tubby.

“And if it’s twice as far away it exerts one-quarter the force—that’s ‘inversely as the square of the distance.’ That’s plain, isn’t it?”

“No—yes,” said Tubby. “Why did we roll—”

“I’m coming to that. Now you see, every particle of matter in the universe attracts every other particle. That ball, therefore, attracts the sun, the moon, and all the stars, just as they do it. It attracts the earth also—as the earth attracts it.”

“But the earth is so much bigger it holds it down tight,” said Tubby. “Ain’t I right?”

“You are indeed,” beamed the professor. “The reason we had to place the ball in a certain position at eight thirty-four to-night is this: I have calculated—I am a very wonderful man, you know—I can calculate anything—my figures show that in nine hundred and eleven years and a few odd days, minutes and seconds, the orbit of Neptune will bring that planet into collision with a new comet which has just been discovered.”

“A collision?” repeated Tubby. “That’s bad.”

“Yes,” said the professor. “Very bad, because you see if that took place, then, a few centuries later—I have the exact figures written down—Neptune would so disturb Uranus and Saturn that they would cause Halley’s comet to collide with Mars.”

“Another collision,” cried Tubby with concern. “That’s *very* bad. Ain’t I right?”

“Yes,” said the professor. “Because, you see, if Mars is thus deflected from its normal orbit, it will affect both the earth and Venus very materially. Worse than that, within a few million years Venus will collide with—”

“Gosh,” ejaculated Tubby. “Things *will* be on the fritz then, won’t they?”

"Yes. Listen. When Venus does this, then, a million or so years later, the earth—"

"The earth has a collision, too," Tubby interrupted. "Ain't I right?"

The professor nodded. "But you see, we moved that ball. Its attractive force altered the position of Neptune to-night. Very little, of course, but enough to avoid that collision nine hundred and eleven years from now. I figured it all out—and that danger's past."

"Are there any others?" asked Tubby in alarm.

"Millions," answered the professor. "I have them all listed and I'm watching them. With that ball—and a thousand others I have in the next room—I can take care of them all."

"Fine," said Tubby. "We're all right then. That's fine."

A short pause.

"You ought to get a man to help roll the balls," Tubby added. "Is *that* what you wanted to see me about?"

The professor had fallen again into abstraction. Tubby's question brought him back with a start.

"No," he said. "Not exactly. It was about specific gravity I wanted to see you."

"What kind of gravity?"

"Specific gravity deals with solid objects immersed in a liquid," the professor explained grandly. "A man in water—for instance."

"I can't swim very well," said Tubby. "But I can float."

"Of course you can. That's what I wanted to see you about—to test out my great invention."

"What is it?" Tubby asked.

The professor's little chest expanded proudly. He sat up so straight on the stool Tubby feared he was about to tumble forward into the tank.

"My invention makes water so that nobody can sink in it," the professor stated slowly and impressively.

"Great!" exclaimed Tubby. "Then nobody can't never get drownded. Ain't I right?"

"Yes," answered the professor. "You are a man of perspicacity, I see. I like men of perspicacity. Also ships will float better. Also—"

Another thought suddenly came to Tubby. "I got a question I want to ask, professor. Why can I float when Jake sinks, and he's so much lighter'n me?"

"I'll explain it all," said the professor. "The law of floating bodies is this: 'The weight of a body immersed in a fluid is equal to its own weight minus the weight of the fluid it displaces.' "

"Oh," said Tubby.

"That works like this," the professor went on. "Take water, for instance."

"Take me and Jake, and water," suggested Tubby.

"Who is Jake?"

"A skinny guy."

"All right. We'll take you and him, and water. Now water weighs about sixty-two and a half pounds per cubic foot. It differs according to what kind of water it is—salt water weighs much more. Now about the water you displace—do you understand that?"

"Yes—no," said Tubby.

"Take a bathtub exactly filled with water and get in—head and all. The water that flows over the edge of the tub is the water you displace."

Tubby nodded.

"Now if you weigh that water you get the weight of the water you displace. Do you see?"

"Yes," said Tubby.

"Now to find out what you will weigh in water, we take your weight—"

"Hund'ed and ninety pounds—naked," Tubby prompted.

"And the weight of the water you displace—is, say, a hundred and ninety-five pounds. Thus you would float by a margin of five pounds."

"Yes," said Tubby. "How about Jake? He weighs hund'ed and five."

"He might displace only a hundred pounds of water. Then he would sink by a margin of five pounds. Thin men generally sink. That's because they are *heavier* in proportion to their bulk than fat men—because the skeleton—the bone—weighs more for its size than fat does. Do you see?"

"Yes," said Tubby. "What's your invention?"

The professor rose to his feet. "I'll show you."

He got down on his hands and knees at the edge of the tank. Tubby sat beside him laboriously.

Two wires, connected with little cylindrical cases, led down into the tank. Tubby could see that the water around the wires was boiling sluggishly. Two other wires stuck up into the air; like a little wireless outfit, Tubby thought.

"A molecule of water is composed of two atoms of hydrogen and one of oxygen," explained the professor. "H-O is its chemical symbol—you see I am a professor of chemistry as well as physics."

"Yes," said Tubby. "Go on."

"Now it is well known that an electrical current will change water into oxygen and hydrogen—that's called electrolisis of water. See?"

Tubby nodded.

"My invention is something like that—only different. *My* current takes oxygen from the air and adds it to the water. Now as oxygen is heavier than hydrogen it makes the water heavier. And yet it does not change the water in any other way—that's the peculiar part."

"That *is* peculiar," said Tubby.

"What *I'm* going to do," the professor continued, "is build a lot of big plants like this little one here and make the water of all the oceans heavier so that nothing can sink in them."

Tubby nodded again. "What do you want me to—"

"I want you to test my tank," said the professor. "I calculate you should float with head and shoulders out. Try it and see. Jump in."

Tubby drew back in sudden fear. "Suppose I sink? You might 'a' made a mistake, professor." He climbed to his feet hastily.

"Nonsense," said the professor. "Jump in." He stood up also.

Tubby shook his head. "I ain't interested in jumpin' in," he said decidedly. "*You* jump in—I'm goin' home. I—"

He got no further, for the professor suddenly gave him a violent shove. Tubby staggered and plopped down into the tank, sinking like a lead plummet. A roaring filled his ears. He scrambled about on the bottom of the tank, feeling as though he were glued down.

What was it Jake had said? "If you're heavier than water you sink." Jake was right, then—and the professor was wrong.

A dim, distant voice came down to him through the water—the professor's voice. It was muffled and blurred, yet distinct enough for Tubby to hear the words.

"Oh, my goodness," it wailed. "I've made a mistake!"

Tubby was quite sure he'd made a mistake. He wanted to shout back his agreement, but the water choked him.

"I've made a mistake!" the professor's voice wailed again. "I've been taking *hydrogen* out of the air instead of oxygen! The water is lighter than ever. You can't float—you'll never come up!"

The water was black as ink and icy cold, especially at the back of Tubby's neck. Funny! Why should that be when he was wet all over? He would have to ask the professor that. But how could he, if he were never coming up? That was most annoying. There were a lot of things he wanted to ask the professor.

The first man bent over Tubby contritely, an empty glass in his hand.

"I didn't mean to spill it on you," he said. "I was drinkin' it, but somebody bumped me."

"You're right, Jake. You didn't mean to spill it—somebody bumped you," said the second man.

[The end of *The Gravity Professor* by Raymond King Cummings (as Ray Cummings)]