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Positive Inertia

There was a strange light in the professor's eyes, a new ring to his voice—He had changed—

by Arthur Purcell

POSITIVE INERTIA! That's what Professor Wilson called it, and he ought to know; that's his business. He's in charge of the experimental physics department of Logan College, and his laboratory is the Mecca for all the great and near-great of science. But, speaking of positive inertia; it made a Sampson of a little shrimp and almost destroyed a college. This is how it started.

One day, I was putting the squad through some dummy tackling, wishing I had fewer Class-A scholars and more Class-A athletes, when some one tapped me on the shoulder.

"Are you the football coach?" asked a mild voice from somewhere about the level of my shoulder. I looked down to see Professor Wilson, a mild-faced little man of middle age, gazing up at me from shrewd gray eyes.

"Yes. Glad to see you." I shook his hand, then turned to watch the squad at their tackling.

But, he cleared his throat and went on:

"Would you like to win the game against State to-morrow?"

Would I like to win the game against State? Would I like a million dollars or— Why, State had been champion of the conference for three consecutive times and was steam-rolling to a fourth. And Logan College, with the stiffest

academic requirements of any college in the country, hadn't beaten State in fifteen years. Would I like to win against State?

My eyes must have answered his question because he nodded and went on: "Come to my laboratory to-night about eight."

I WAS THERE at the exact minute. He met me at the door and escorted me through the copper-and-glass maze of his laboratory and into his private office, where he seated himself at a desk upon which was an intricate machine which seemed to consist chiefly of a glass tube about four inches in diameter and about a foot long. Upon this was coiled a long string of copper tubing which in turn was wrapped with a fine insulated wire. The two ends of the copper tubing terminated just within opposite ends of the glass tube. On the desk, near this apparatus, was a powerful pair of mechanic's pliers. I seated myself opposite him.

"Mr. Hyde," he began abruptly, "I'm going to suggest something which may at first seem unethical, but upon subsequent analysis, I am sure you will agree with me."

"Well, what is it?"

"I——" he hesitated. "I don't know much about the game of football, but,

I believe that the object of the game is to place the ball on the ground behind the opponents' line more than they do behind yours. Is that right?"

"That usually brings victory," I conceded with a grin.

He nodded, then apparently changed the subject. "Did you ever hear of Ben Masters?"

"The big steel magnate?"

"Yes." He smiled. "Ben and I went to school together, and, in spite of the physical, economic and intellectual difference between us, our families have continued our friendship. Physically, Ben is a big man. His son of about the same age as mine is as big as Ben. But my son, William, has a stature like mine, but more slightly built. The physical difference between the two boys is about seventy pounds."

"But what has this to do with——"

"I'm coming to that."

"Is his son, Billy Masters, the all-American on State's team?"

"Yes, I believe he is. But, this is my reason for coming to you. A few days ago, I wrote Ben Masters, as the only wealthy friend I have, to ask him to donate a hundred thousand dollars for a private laboratory which I wish to set up."

"And he refused?"

"Not exactly. He said he would let me have the money on either one of two conditions: Either that my son stop courting his daughter, Alice, or that Logan College beat State in their game to-morrow." He raised a letter from his desk. "This is his reply here."

"If he put it in writing, he certainly couldn't get out of it gracefully—if we won, could he?"

"Ben wouldn't try to get out of it. He is a man of his word."

"But, if you are friends, why does he object to your son's attentions to his daughter?"

The professor smiled: "He has always been proud of the athletic prowess of his family and—er—he wants grandsons as big as he is. That is where my son and his love for Ben's daughter enter. You see, Ben doesn't think Logan College can win."

"Frankly," I replied, "neither do I."

"I DISAGREE with you," Professor Wilson retorted mildly. "My son is going to win for Logan to-morrow, if you use him. In that way I can show Ben physical prowess and scientific intelligence, too, and, also, assist my son's courtship, of which I approve."

"But how?"

"Did you ever hear of positive inertia?"

I shook my head.

"Neither has any one else. But it is a name for a physical property which I can induce in any bit of matter, organic or inorganic, by means of this apparatus here." He pointed at the glass-and-copper apparatus on his desk. "First, allow me to explain further. You know, of course, that you could stop a feather moving at a speed of ten miles an hour with the greatest ease. But you also know that a mass the size of the earth moving at the rate of ten miles an hour couldn't be stopped until it had met a second mass whose inertia could be expressed in the mass velocity of the first. Have I made myself clear?"

"Go on." I avoided the direct question.

"Then, suppose a feather by means of Inertia-X were given the mass inertia of the earth."

"Why, if——" I gasped at the thought. "That feather, going no matter how slowly, could penetrate—— It could——"

"Exactly," he assisted me. "And, if my son were given only a mass inertia of let us say twenty thousand pounds,

all the football teams in the world couldn't stop his progress to his goal."

"Do you mean you could give my team that inertia—that you could make it impossible for us to——"

"I could, but I wouldn't. It would be too dangerous. I'd only give it to one man."

"That's great——" I began enthusiastically, then checked myself. "Do you



And then the coin—that tiny thing—fell to the floor, splintered the concrete—and——

think that would be fair?"

He nodded sardonically. "As all things are fair. I've given the matter careful thought and decided that it is; and this was my conclusion. Ben Masters has an all-American son because Ben Masters is himself a big man with the physical alertness of a cat. He gave those physical functions to his son by fleshy heritage and, no doubt, a great deal of instruction in the fine art of gridiron mayhem during his early years. We can presume that that is true, can't we?" Then, as I nodded, "Then is there any reason in the world why I shouldn't give my son some of the physical properties I neglected to give him at birth?"

"You put it very cleverly, professor."

"Only logically," he replied dryly. "Now, Mr. Hyde, I have no great interest in football, but I am interested in the hundred thousand dollars so vitally needed for my experiments; experiments of which I can say nothing until they are complete, such as this property of Inertia-X. It is really only half discovered and, until I can find some way of controlling it, it would be dangerous to let the world know of its existence. Chaos and mob terror, the most fearful destruction might result from it."

I THOUGHT he was merely evincing the usual scientific caution and was unduly apprehensive. But before twenty-four hours had passed, I learned that he was only speaking conservatively.

"Did you want me to use your son on the team?"

"Yes. He's not as heavy as I am but—er—you will find him quite mentally alert. Besides that, he knows the risk he is taking. I know, too. You see, the induced inertia might stop his heart or—— But, he wants to do it for me and the girl he loves."

At the time, I ignored this latter statement, only envisioning the laughter with which the presence of a little

shrimp on my team of huskies would be greeted. The little professor must have read my thoughts.

"Furthermore, I wish you to place William opposite Tom Haley."

"Tom Haley, State's all-American end!" I groaned.

"Yes. He is the type that Ben favors as a son-in-law."

"But, after all, how do I know that your son will have this—this inertia tomorrow, if I do put him on?"

"You have a right to be doubtful. It is the true scientific attitude." The professor smiled whimsically. "I'll show you. Now, this little machine here," he pointed to the apparatus on his desk, "is a small model of the one I shall use on my son to-morrow. I shall work a simple experiment to clear away your doubts. I prefer to use something of yours so that you shall know there is no—no fakery. Have you a small coin?"

I took a copper from my pocket and was about to give it to him when he shook his head.

"Drop it on the floor please."

I did. The coin started to roll merrily under a cabinet, but I retrieved it. Again I started to give it to him, but he arrested me.

"Now, place it just within this glass tube." He pointed to the apparatus between us. I obeyed. He rose from behind the desk and threw two switches which were on the wall behind him. There came a faint hum which faded into a pulsing vibration which seemed to be attacking my very life. The flesh of my body seemed to become heavy, the muscles, puny sinews incapable of movement. Breathing became more and more difficult. I tried to rise from the chair and couldn't.

"There's nothing to worry about," the professor's voice assured me. "The center of the vortex is within the tube and can't harm you. The lethargy you

feel is only a vibratory harmonic of what is taking place within the tube. It will leave you in an instant."

Suddenly, my lassitude was gone. The professor had opened the switches, the vibration had ceased.

"Now, although the coin weighs no more than it did before, it is possessed of an inertia of approximately five hundred pounds, so, be very careful when you handle it and be sure that you change its direction very slowly or you might receive a severe bruise. Don't forget that every molecule of its mass has all of the inertia of the whole mass. Now, take those pliers and pick it up; and please be careful."

AGAIN, I thought the professor was being unduly cautious. So, I was careless and got the surprise of my life. First, when I started to pull the coin from the tube with the pliers, it didn't move, and I thought it had become welded to the glass. I tugged mightily and it moved reluctantly toward me, firmly clutched in the jaws of the pliers. Its inertia was backing me against the wall, and I tried to swing it in an arc, but, though it was almost weightless, it continued sluggishly in the original direction I had given it.

As it moved toward me the handle of the pliers began pressing against my stomach, backing me into a corner of the little office. I pushed against it with all my might, and succeeded, with my back against the wall, in bringing it to a stop. My brow was bathed in perspiration.

"Now, get your feet out of the way and let it drop."

Obedying, I opened the pincers and followed the coin with my eyes. It fell to the floor, splintered the concrete and disappeared.

"That is Inertia-X." The old man smiled at me proudly. "You can see its possibilities and its danger, can't you?"

"I'll take your word for it that your

son will have some method of controlling it to avoid injury to the opposing players."

"My son will be well padded, so that the opponents will receive no injury as long as he doesn't step on them with the control closed. But he understands that."

"How much of this inertia will you give your son?"

"Oh something under twenty thousand pounds."

"Will he have it for the rest of his life?"

"No, only for about three hours."

"But, while the inertia is in him, how will he be able to lift his legs quickly? They'll have some of that inertia, too."

"Yes, they will. But, this little apparatus will take care of his moving problem." The professor held up a leather case about the size of an envelope and about twice as thick. It was attached to a heavy leather belt, the inner side of which was studded with copper rivets. "When William wishes to use his induced inertia, he has only to press any part of this case, which will be at his waist. We must leave the belt on him until after the induced inertia has left his body."

"But, what if something goes wrong with that thing? Your son might be torn apart by his own inertia."

For an instant, a worried frown creased the professor's brow, then he smiled confidently.

"Oh, nothing will happen to him, because every molecule of his body will possess all the inertia as well. No, no. This apparatus is very simple and nothing will happen."

And I, like a chump, took his word for it. I should have remembered that the professor knew little about football, and that a delicate thing like an inertia compensator could get out of control.

THE NEXT DAY, I was giving the boys a last talk in the dressing rooms at the stadium, when Professor Wilson walked in. He was accompanied by a somewhat anæmic-looking young fellow who was clad in football togs which failed to conceal his slightly built figure.

"This is my son William," the professor stated quietly. "He is ready to win for Logan." And with this statement, he turned and left the room.

For an instant there was amazed silence, then the team, as one man, broke into gales of laughter. Williams' intelligent eyes twinkled with them, but he smiled with a deeper enjoyment than they—sardonically.

"You all'd better go out and warm up now." I tried to frown at them. As the team began to leave, I nodded to "Pug" Anderson, the captain and quarter back, to stay behind.

"Pug," I stated when we were alone, "if I send Wilson into the game put him at end opposite Tom Haley of State, and give him the ball as long as he continues to make yardage."

"But—er——"

"As long as he makes yardage," I insisted.

"As long as he makes yardage." Pug began to grin. "What's the matter coach? Did Professor Wilson——"

"He didn't," I interrupted, "and I'm not joking."

He nodded to himself in wonder as we crossed the room.

THE STADIUM was packed, all eager to see State flatten us to the tune of a mighty score. The bands played and the cheering sections roared their challenge. It was a big day because, though the game between Logan and State was rarely much of a contest, it was packed with the tradition of many years' play. And then, too, in the heart of the Logan rooters was the hope that

some day their David would conquer the Goliath; and, about once every ten or fifteen years, they were not disappointed.

Then the game began, and I saw a miracle take place before my eyes. Logan College just stepped in and tore the great State line to pieces. I began to grin in triumph. I knew what had happened. Pug Anderson had told them about Willie Wilson.

Near the close of the second half Abe Lynman snagged a pass from Pug Anderson and zigzagged his way to a touchdown, which brought the stands to their feet in roaring approval. The half ended, and I herded the boys to the showers.

"Great work!" It was Jimmy Ralson, a reporter for the New York *Examiner*, walking beside me. "I heard you threatened to put the biggest sissy in the school on the team and made them so mad that they did this. That's using the old bean." He gave me a wise wink and disappeared.

Then the second half began, and State's machinelike attack and immense reserve power began to tell upon my boys. They began rolling up yardage against us and made a touchdown just as the third quarter ended. Before three minutes had passed in the fourth quarter, they made another.

I felt a touch on my arm, and looked around to see Willie Wilson who had slid up alongside me. I had entirely forgotten him in the excitement of the game.

"I know how you feel about using me." He smiled at me almost shyly. "If it wasn't for the laboratory father needs, I wouldn't do it; but, don't you think it's time to send me in?"

I was hesitating, when the decision was made for me. The referee's whistle blew, and then I saw Bailey, our center, being carried off the field. I nodded to young Wilson and, as he passed

Bailey coming off the field, heard the announcing system informing the multitude that Willie Wilson would replace Bailey at center.

"Coach"—Bailey painfully seated himself on the bench looking at me in surprise—"Canterers is my substitute."

I pretended not to hear him and watched the game with growing apprehension, and then with chuckles, as the humor of it made me forget the unethical advantage I had taken of an opponent.

STATE saw little Willie, one hand hanging close to his waist, the other awkwardly stretched out, standing up in the center of our line. Their quarter back couldn't resist the temptation to make their next touchdown over that apparently inviting weakness. They came out of their huddle; their left half grabbed the ball on a double reverse, fainted toward right tackle and then, behind a thundering three-man interference tried—all tried—to brush Willie aside for their touchdown. But instead, the interference came to a sudden and crushing stop at Willie's breast; the back caromed off his interference and fell, half stunned behind his line of scrimmage for a yard lost.

I was dimly aware of a roaring from the stands as State picked itself up slowly and went into a huddle. They came out of it and tried the same play. Again they bounced off Willie's twenty thousand pounds of inertia; but that time, their half back fumbled the ball and I saw Willie, hand free of his belt, spring and fall upon the oval on our two-yard line.

Then my boys went into a huddle. They came out of it just as the referee began walking toward them, and I knew Pug was having an argument with his teammates about Willie. As the team approached the line, I saw that Willie was playing end, opposite Haley of

State. They were in the logical punt formation; but, when the ball was snapped, there was a simple reverse behind the line of scrimmage, and then Willie appeared running with the ball in the safety zone. He was not very fast and two State men leaped at him.

Before I could give utterance to a groan of despair, I saw Willie press a hand to his side and saw the leaping figures carom off him, as he called upon that twenty thousand pounds of inertia for an instant; but, during that instant I saw Willie's body grow rigid in a leap, until his hand moved away from his belt, and realized that he had encountered an unexpected obstacle in overcoming the inertia of the pressing arm. He stumbled, caught his balance and then began to run again.

But, unsuspected by Willie, Haley of State came up behind him and brought him to the ground, after a gain of about ten yards. But this gain was enough to send the stands into an uproar, and Willie's name shouting from many lips.

AS OUR TEAM came out of its huddle, I saw Willie pulling at his belt line. Then I saw him making test swings with his hand, brushing his waist as it passed, and realized that he was meeting the first problem which had presented itself. I realized that he planned to swing his left hand in such a way that it would give a momentary pressure on the apparatus at his belt during instants of tackling, and was trusting to the artificially induced inertia to then carry the hand away from his waist with the same motion. It was clever and it worked beautifully.

On the next play, he was again given the ball. He was not a fast runner and every one of the State team had the opportunity of tackling him; but, as each tackler sprang, I saw his left hand quickly brush his side. As the tackler bounced off him, I saw Willie grow

rigid for the fraction of an instant during which his induced inertia lasted. And I realized from the agonized expression on the boy's face that he passed near me that the physical strain upon his body must have been tremendous.

But Willie ambled through their team, down the entire length of the field and over the goal for a touchdown, with the State team sitting upon its haunches from various positions about the field, staring at him in wonder—while the Logan cheering section went made with joy.

Pug Anderson failed to convert, and we were one point behind when State elected to receive. There was less than three minutes to go.

Pug kicked for coffin corner, a high, arching kick, giving the team plenty of time to get down under it. Their quarter back caught the ball, fumbled it, caught it again and started to run with it. But, Pug, running madly down the field, cut through the forming interference like a one-man tank and nailed him on their twelve-yard line. Then State called for time out.

"What's that little shrimp on your team?"

I looked up to see a powerfully built, ruddy-faced man of middle age scowling down at me. I had seen his picture in the papers so often that I recognized him immediately. It was Ben Masters.

"That little shrimp is Willie Wilson, son of Professor Wilson," I informed him.

"You mean that's William?" I became aware of a very lovely girl who was staring at me in amazement and worry. I nodded.

"But he might get hurt," she exclaimed. "You shouldn't have sent him in. He isn't—"

"He's the best player on the field. Where would Logan be without him?"

"Why, yes." She smiled and turned to her father, her eyes glowing with

pride. "Did you hear that, dad? Where would Logan be without him?"

"There's something phony——"

But Masters broke off as the game began.

STATE, unable to believe that Willie's actions had been more than luck, and probably urged on by Tom Masters and Tom Haley, tried to brush around end, where Willie stood with one arm awkwardly outstretched, the other ready to swing by his waistline. I saw the hand touch his waist as Haley plunked into him head first and then came to an abrupt stop, as if he had collided with a brick wall. Tom Masters, not expecting the abrupt stop at his friend, crashed into him and fumbled the ball. Willie leaped, scooped it up; a tackler plunged at him, almost missed, then clutched frantically at his belt, half tearing the pants off him.

THEN, the thing that I had forgotten to fear, happened. The ball flew from Willie's hand and over the goal line. Pug Anderson fell on it. But the triumphant roar from the Logan stands became suddenly hushed and awe-stricken as Willie, deprived of his compensating apparatus and therefore unable to control his artificial inertia, became statuesquely rigid in running position, fell slowly to the ground, then slid along, gouging a deeper trench as he fell.

The goal post collapsed before him as if it had been matchwood and seemed to have little effect upon his momentum. Just behind the goal zone, an automobile with a motion-picture camera in the back seat, lay in his path. The driver, seeing what had happened to the goal post, tried, frantically, to get his motor started and out of the way; but Willie, like a slow-moving projectile, crashed into the side of the car, bent its steel strength into a grotesque U and, push-

ing the wrecked car before him, came to a slow stop.

In the vast stillness which gripped the stadium at this sight, I heard an agonized cry from Professor Wilson, who had joined me.

"My boy," he cried. "One of the tacklers tore off the compensator. The inertia is crushing him. He is suffocating. He can't overcome the inertia of his chest. He can't breathe." He turned to me, holding out an envelope-like compensator with its belt attachment. "You can run faster than I. Please!"

I understood. I grabbed that belt and ran the fastest fifty yards of my life, brushing aside members of both teams as they continued to stare in awe at the slowly purpling figure which was resting in the cradle it had made of the car.

Hurriedly, I strapped the belt around the narrow, motionless waist and pressed the compensator. A great sigh was my reward and, when I saw Willie take a deep, grateful breath, I drew one with him.

Then, in spite of the fact that a few minutes before he had been on the verge of a horrible death, he grinned and asked: "Did we win?"

And I understood why such a lovely

girl as Alice Masters loved him in preference to so many others.

"You did."

I turned to see Ben Masters, who had answered the question, smiling down at the boy narrowly, but with a twinkle of approval in his eyes.

"I'm not so sure about that." It was the referee speaking.

Professor Wilson hurried up and sighed with relief as he saw his son climb to his feet, then turned to Masters: "Well, Ben," he asked, "what about it?"

"As far as I'm concerned," Masters informed him, "Logan College won. You win, because any fellow with the guts to play with—with, I don't know what, deserves"—he turned until his glance fell upon his daughter—"deserves anything."

Alice flushed rosily as she glanced at Willie, who smiled back, pale but strangely unbruised.

I'M writing this while the athletic board considers my dismissal. But speaking for me is Professor Wilson, who threatens to leave the college if my contract is canceled. There are lots of good coaches and Logan can get along without me; but, there is only one Professor Wilson and—maybe they'll forgive me this once.