



*Then, as they watched, Hardy  
went cold with fear!*

## Pre-Vision by John Pierce, M.S.

*"While the advanced (anticipated) potentials, as well as the retarded potentials, satisfy the electro-magnetic equations, the former have generally been discarded for the reason that it has been more in accord with the trend of scientific intuition to consider the*

*present is determined by the past course of events than by the future. However, if it is once admitted that the present state is uniquely determined by any past state, it follows that the future is also determined, and hence the employment of a future as well as a past state in*

*specifying the present marks no inherent departure from our accustomed methods of description—"*

*Leigh Page*

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**H**ARDY STUART gazed at the flickering screen. Green blobs of fluorescence danced on its surface. His brow was knit in perplexed disappointment. Suddenly the blobs wove themselves into a picture—a rough, shimmering representation which Hardy recognized as that of the laboratory in which he stood, but this scene of the future, for so it must be, was strange. It showed a body lying on the floor, with a figure beside it, bending over. Other figures—all very indistinct and unrecognizable, rushed in through the door—

Then, suddenly, the image disappeared. A dull, red glow took its place, shining through the green fluorescence which still seemed to linger on the screen. Hardy gave a cry of alarm and put up his hand to shield his face, but he was not quick enough. Something hurled itself from the screen, and, as he turned, struck him on the side of the head. Then he sank into unconsciousness.

His next impression was of crying, "Rhonda, an image!" Collecting his wits, he realized what had happened.

Yes, Rhonda was there, holding his head on her lap and wiping the blood from his temple. He glanced up and saw the shattered screen of the synthesizer. Then he realized that Rhonda was speaking.

"Don't move," she said. "I've called your friend Dr. Morris. He'll be here presently—"

"But Rhonda," he insisted, "I got an image—"

"There," she interrupted, laying her

hand on his temple. "Just relax. Don't worry about it now!"

Hardy had rapidly gathered his wits, though a sort of physical numbness from the blow still hung over him. "So," he thought rather bitterly, "even now she doesn't believe anything happened. She thinks I'm out of my head from the blow." Somehow it hurt him—why it should he didn't know. Certainly no one else would have believed. Perhaps she was as sensible as the rest.

No one denied Hardy Stuart's brilliance, even in the most sanctimonious scientific circles. "He's the man who, at the age of twenty, found the Stuart-Binnet solution for the unified field equations," they would remark. "But his late work—a little—obscure."

Frankly, Hardy considered, they thought it more than obscure. "Half-cracked," Morlin, his blunt employer had told him on one occasion. But Morlin couldn't get along well without him. Things turned up about the electron reaction rocket. A hint was needed about navigation through the comet disturbed orbits of the asteroids, and no one else could properly set up the orbital calculators in such an unforeseen emergency.

Morlin had to pay him, Hardy thought, and even finance his work on—anticipated potentials—even though Morlin and the scientific world had thought it the delusion of a brilliant mind gone astray after the collision near Jupiter.

Hardy admitted to himself that the days in the abandoned rocket were enough to have driven any one out of his mind. But instead he had thought in terms of equations. He had thought and thought, and scratched formulas on the glossy finish of the ship's imitation woodwork. Instead of madness had come the solution of the problem of anticipated potentials.

He remembered the stir in the scientific world. Yes, they had had to

acknowledge his sanity up to a certain point. The introductory mathematical work was impeccable. But there was a bold intuitive step, and it was because of the result he obtained that they would not credit this. Why, Hardy thought, it is conservative when compared with Einstein's later work. But he alone saw it that way.

SUDDENLY Hardy was conscious of his physical self again. He must have fainted, he thought. Now Rhonda and Dr. Morris were lifting him, and it hurt. Others were there, too, some assisting and some gazing with the awe-struck stupidity of people witnessing an accident. He endeavored to smile at Dr. Morris.

"It's all right," he managed to say. "The evacuated viewing tube fused at the base, and the air pressure drove the electrodes clean through the front of the thing. I guess I got it in the head."

"You did," said the doctor. "Take it easy now, and we'll get you up——"

Hardy did take it easy. He suddenly felt giddy. He was sinking into blackness. Then there was a ringing sound.

Hardy's next recollection was of being in an immaculately white bed. He felt very comfortable save for a sort of stiff sensation at the side of his head. Well, he thought, I'm out of this scrape all right.

At that moment a white-clad nurse entered. She saw he was observing her, and going to the window, raised the shade. Then she turned to him.

"I'm Miss Jenkins," she said.

"The Morlin Company Hospital?" he asked.

"Yes," she replied. "You're really not very badly hurt, though we thought it best not to disturb you. There are some visitors, though."

"Bring them in," he said.

The nurse left the room. As she went he noticed that she was rather pretty, decidedly pretty, in fact. How-

ever, as Rhonda entered the room, he realized that she was far better looking than the nurse.

Morlin, Rhonda's father, was there, too. Hardy knew then that he was going to get a real bawling out. He was too valuable company property to endanger his neck by fool experiments. That's what Morlin would tell him. Thank heavens Rhonda had come along! Perhaps she could hold down her father a little. Hardy shuddered in anticipation. Morlin was a person of strong will.

"Hardy," Morlin began, "if those—electrodes had hit you any squarer they'd have bashed in your skull. I hope it'll teach you something. Why can't you leave this damned tinkering to somebody else? You know——"

Hardy put on a look of weary resignation and closed his eyes. He supposed he'd have to face it.

"Dad," said Rhonda, "that's no way to treat a sick man. I thought you were going to be tactful."

"He had to come," she continued, speaking to Hardy. "He was really worried about you."

"Oh, all right," interrupted Morlin, "but you said you'd talk to him. I'll go along if you want. But," he added, "don't forget."

When Morlin had closed the door, Rhonda spoke to Hardy.

"He's right," she said. "You shouldn't waste your time doing dangerous experiments like this. There's too much valuable work you could do for the company. I promised to tell you that," she added.

"Then you don't believe——" he began. "You know that nobody but myself could, or would, carry on this work. And when you, out of Science Institute, promised to help me, I thought——"

"Oh, Hardy, can't you see?" she asked. "It was really to help father. He wanted somebody as your assistant

to help you, to make you see that your ideas were——”

“And I thought that you had some faith in my ideas,” he said. “How it could escape you. It’s all as simple as high school physics. Any one with a glimmering of sense ought to understand it.”

HARDY felt a sort of rage come over him. I’m going into one of my usual tirades, he thought. Well, it’ll serve them right. Then he let himself loose.

“You’ve heard about retarded potentials, haven’t you? Any one has. Even radio engineers,” he added bitterly, remembering that Morlin had started as a technical man.

“Retarded potentials are used in solving the Lorentz-Maxwell equations,” he continued. “It all seems pretty reasonable. The effect of accelerating an electric charge, that effect which we call electromagnetic radiation, or radio, or light, can’t be detected at a distant point until some time later. That means we see events after they have happened. What we see is the past, so to speak. That’s because electromagnetic waves travel with a finite velocity, they say.

“Light is just the effect caused by accelerating the electron, rushing off at 186,000 miles a second. And the light doesn’t get here from the Sun, for instance, until after ten minutes have elapsed, because it takes that long to travel here. So what we see is the Sun of ten minutes ago.”

“Yes,” said Rhonda, a pained look on her face. She had heard this before.

“Well, it’s all wrong,” he almost shouted. “It’s all wrong. We see the light from the Sun ten minutes after some electron jumps into an atom because Maxwell’s equations say we will. Or rather, the Lorentz-Maxwell-Mahler equations. The physical picture people have is all wrong. I don’t know myself what the true physical picture is. But

there aren’t any light waves, as people think of them, that travel through space. That should have gone out with the luminiferous ether,” Hardy snorted.

“Even from Maxwell’s equations, if a sane mathematician solves them, there’s an anticipated potential as well as a retarded potential,” he continued. “There’s something here to detect ten minutes before the electron jumps into its new orbit just as certain as there’s something to detect ten minutes afterward. We call the thing we detect ten minutes afterward light.

“Well, the other thing isn’t light. Maxwell’s equations are wrong. But it is something, and just as sure as light tells us of the past, it can tell us of the future. Mahler was right, only he didn’t know what he had. I know. I’ve tried to show people. They thought of my theory what they thought of Maxwell’s—that it was more ingenious than true. But now”—Hardy pronounced the words slowly—“I’ve seen this other disturbance. I’ve seen beforehand what is going to happen.

“Like the Kevin space projection mirrors that we send out, which enable us to see your light waves that left the Earth years ago, I shall see the Earth of the future. I send out a mirror that lets me see my anticipated potential waves that will leave the earth years from now. And, by heavens, it works,” said Hardy. “I saw the very accident that laid me out.”

He looked at Rhonda triumphantly. Then he was confused. What was the matter. Why, she was crying. So, he thought, she thinks me mad, too. He turned away quickly, lest she observe that he had noticed.

“Why don’t you say something?” he asked.

“Oh, Hardy,” she said. “Can’t you give this idea up—for a while at least? Father’s so angry. And I, oh, I can’t bear to think——”

Still weeping she got up and left.

Hardy was downright puzzled about this last. She needn't take it so hard, he thought. After all, he was only one of her father's employees, a little more valuable than most, perhaps. But Morlin could get along without him and scarcely feel the loss. Well, he thought with some little satisfaction, that was partly because of the advantage he himself had given Morlin over Morlin's competitors. After all, without the electron reaction rocket—

Hardy had to give up his work on anticipated potentials, at least at the Morlin plant. He couldn't stand the attitude any longer, couldn't face old Morlin out. But, he decided, if he was supposed to be cracked he'd have to show the craftiness of the madman. So he set up his apparatus at his home, and said not a word to any one.

He found it rather difficult to work double time—days at Morlin's plant and nights at home. But he managed rather well by emphasizing his really rather failing health. Morlin was glad enough to have him around for even shorter hours. Rhonda was very helpful. It was strange, Hardy thought, that a woman like Rhonda could be so interested in scientific work, and so talented at that. Why one of these wealthy fellows didn't persuade her to marry him was more than he could see.

Instead she seemed only interested in the laboratory—always willing to learn from him—about anything but anticipated potentials, he reflected. And she was always worried about his physical condition. She had even asked him to cruise on their yacht, to him an unheard of honor.

He had pleaded that he could not leave his work. If they had only known that he meant his private work on anticipated potentials, they wouldn't have been so cordial, he reflected. And wonder of wonders, Rhonda herself had not gone on the cruise, but had stayed to help him in the laboratories.

Hardy found it a hard task to work on the intricate apparatus without the facilities of the Morlin shops. He had plenty of money and machinery, but had never been a particularly skillful machinist or mechanic. He had to learn now. But he had patience and time, and a will to do the task he had set for himself. Gradually he fabricated the apparatus.

Weary weeks were spent plugging leaks in vacuum systems. Weary months followed as he replaced part after part, faulty through his awkwardness. But he rather enjoyed working with his hands so much. And he always had his end in view.

It was a full year and a half after the wreck of his apparatus that it was rebuilt. This time, he flattered himself, it would work better. And on that night, though nervous with anticipation, he carefully checked the pressures with a Macleod gauge, before turning on the switches one by one.

As in the disastrous attempt that seemed so long ago, blobs of green flecked the viewing screen. But this time Hardy confidently turned the sweep control, then the intensity. A wavering scene appeared on the screen. Hardy was exultant, yet impatient. Why couldn't he clarify the image, he wondered? Then he became absorbed in that hazy scene on the screen.

It showed the very room in which he stood. Hardy wondered what time in the future it depicted. He was a little doubtful about the time setting—it had been practically impossible to calculate and calibrate the coils accurately. It couldn't be very far in the future, he reflected, from what he knew approximately.

Anyway, it was his room, and he felt sure it was the future, not the past. There was the machine, represented by a wavering green mass. And there were two people in the room. That showed that it was the future, for no

one but himself had seen the machine as yet. Who could the other be? But the wavering outline gave him no clue.

The two figures seemed to be standing, talking. Then one moved toward the machine. As he did so, the other made as though to follow, then suddenly seemed to fall, to collapse. Doesn't this thing show anything but accidents, thought Hardy? He was intent, interested. And at that moment the bell rang.

There were no servants in Hardy's house save the woman who came in the day to prevent total disorder. She was gone now, so he must answer the bell. He hesitated a moment, then snapped the switch that turned off the machine and hurriedly made his way to the door.

As Hardy opened the door he was in a vexatious mood. He felt a little better when Dr. Morris greeted him. If Hardy had few friends, they were good ones, he thought. Hang the machine anyway, he'd rather see Morris, now that he knew it worked. Besides, he might share the secret of his success—

MORRIS looked a little peaked, he thought, as he brought the bottle and glasses. There was something uneasy about him. He seemed to have something to say, too, beyond the inconsequentialities that would finally open the evening's discussion.

Finally it came out.

"Hardy," the doctor said, "Rhonda seems to be worried about your health."

"I'm all right now," protested Hardy. "You don't see anything wrong with me, do you?"

"You look pretty tired," said the doctor.

"No more than yourself," replied Hardy. "And we'll both feel better with one of these under our belts." He handed the glass to Morris.

"As a matter of fact," Morris continued, taking the proffered glass, "it's

more than that. Rhonda has the idea some way that you're working here on your—anticipated potential theory." He looked at Hardy inquiringly.

Hardy said nothing. Both paused for a while, neither wanting to speak. Finally Hardy replied.

"I am," he said.

"I suppose you know what she thinks?" asked the doctor.

"She thinks I'm mad," Hardy replied. "And you?"

"I don't know," was the reply.

Hardy reflected that he did know, or thought he knew. Even one's friends couldn't know everything about one.

"As a matter of fact," said Hardy, "I have the thing working."

He could see that Morris was rather startled. We'd better get it over with now, he thought.

"Come," he said, "I'll show it to you now."

Reluctantly, the doctor rose and followed as Hardy led him to the workshop. He'll soon change his mind, thought Hardy. After all, it's best he should find out that I'm not as mad as he thinks I am.

As they entered the door, Hardy turned to speak to Morris.

"You know the principle of the thing. You're familiar with the Kevin mirror by which we see the past. You really shouldn't be so surprised, you know. This looks a lot like the Kevin mirror, and it acts on much the same principle. I'll turn it on. It takes a few minutes to heat."

He turned toward the machine and reached for the switch. Then a terrible thought seized his mind. This was familiar. He had seen the scene before—it was like seeing a movie twice. Where, he asked himself? Here, a half hour gone! He wheeled about, shouting "Morris" in time to see his friend collapse with an anguished expression on his face. Heart attack, he thought. And this was the man he had seen on

the flickering green screen when he looked into the future, and it was his friend, Morris.

As Hardy bent over Morris, he heard his friend gasp. Then the labored breathing ceased and the man collapsed. Hardy knew that his friend was dead. He was stunned. He could not appreciate the significance of what had happened. But—some way, about the machine there was something that seemed sinister. Twice the machine had prophesied evil, and twice the prophecy had been fulfilled. Hardy was upset. He took a drink and called a doctor.

Hardy could not bring himself to work on the machine for a time after his friend's death. And somehow Rhonda's presence comforted him, in the laboratory at the Morlin plant, so he devoted himself more closely to the routine work and let his masterpiece lie idle and unknown.

BUT he could not continue thus, he knew. Always at the back of his mind was the idea that he should, that he must, continue with anticipated potentials. One day he could stand it no longer. When Rhonda Morlin entered the laboratory that morning he detained her before she commenced her part of the day's work on the atomic reaction gun which they were developing.

"Rhonda," he said, "you'll have to carry on this for a while. You know as well as I where we are. I've something special to set up in the next few days."

"Anything so special that it's secret from me?" she asked.

Hardy found himself unable to tell less than the whole truth.

"It's the anticipated potentials," he confessed.

Rhonda did not seem surprised. She was silent, and Hardy could only guess what her thoughts were. He put his hands on her shoulders.

"Look here, Rhonda," he said, "I know you won't believe me, but it does work. I know it. I've been working on it at home. It predicts things," he continued, "and I've seen them come true." He shuddered slightly.

Rhonda continued in her blank expression. Hardy looked into her eyes, but he could see nothing. It infuriated him. She turned to go, and as she did so, he wanted to do—he knew not what. He was terribly disturbed some way, but did not know just how. He had an impulse to run after her—even to strike her. Then he thought that this was certainly an illogical state of mind. So he merely called after her.

"Rhonda," he said, "the least you can do is not to tell your father, now that I have given you my confidence."

Rhonda left the room, making no reply, to enter her laboratory, and Hardy was left to fume inwardly in an entirely unprecedented and unscientific manner. There was but one thing to do, he reflected, and that was to build up the apparatus. Then when Morlin saw it, and Rhonda, perhaps they would understand. He resolved to conquer his inward disturbance by hard work and lots of it.

He found things progressed much faster in the hands of adequate machinists, and that it was a relatively short time before the apparatus neared completion. The new device was a decided improvement over the old, in both construction and scope of operation, for it would detect the anticipated potentials of events to take place not only in its immediate vicinity, but in a surrounding area of several hundred yards, despite intervening barriers. Hardy realized the necessity of having the device complete and foolproof for the first demonstration. When Morlin knew what was up, there would be no second demonstration if the first happened to be unsuccessful.

All the time Hardy saw little of

Rhonda. She kept pretty much to her work on the atomic reaction weapon, and when she was forced to consult him she assumed an impersonal manner which, after their long period of easy association, left Hardy more disturbed than he cared to admit. To the best of his ability he put that out of his mind, and dwelt only in anticipation of the completion of his invention.

It was finally two months after the undertaking of the task that the machine was completed. He continued to busy himself as usual, however, that Rhonda might be deceived, and secretly sought an appointment with Morlin, who had just returned from the conference of planetary monopolies on Mars. He would tell Morlin what to expect, he reflected; actions speak louder than words.

When Morlin stood before the machine, Hardy could not but feel inward misgivings. His two previous experiences with the machine had been enough to try any one's nerve, he reflected. True, his recent trial had brought no calamity; nothing, in fact, beyond blurred—all the images were blurred; he could not understand or correct that—views of the laboratory and himself working there; views which must have been of the future but were so devoid of interest that they were not easily identifiable.

But Hardy knew that the machine functioned and that the views must be of the future. He would have to take a chance on picking up something of interest in Morlin's presence, he reflected.

"It's a new viewing device," he said to Morlin. "I won't explain it fully until after the demonstration, except to say that it enables us to see that which other methods have hitherto been unable to detect."

"I see," said Morlin, "a sort of super X ray, I suppose."

"You might think of it as that," said

Hardy, noncommittally. "But wait until you've seen it operate."

MORLIN stood silent while Hardy snapped switches and juggled controls. Finally a blurred green image appeared on the screen. Morlin gazed at it speculatively. It showed, in shifting tones, as of objects seen underwater, a room filled with bulky apparatus. Two figures were present, but they could not be recognized.

"Can't you clear it up?" asked Morlin.

"Not at present," Hardy replied. "But it works, anyway. What does the view look like to you, Morlin?"

"It seems familiar," said Morlin. "By heavens, it's the laboratory, and us in it," he exclaimed. "Surely you don't need this fool machine to see that?"

"You'll notice," said Hardy, "that you aren't standing where you are now, Morlin—whichever of the figures is you. Frankly, they're indistinguishable, but that doesn't matter at this stage."

"The past," said Morlin. "But we have the Kevin mirror," he continued. "It's much better."

"It isn't the past," said Hardy, "watch the scene now."

Then an identifying incident, something of the sort Hardy had hoped for, occurred. In the wavering scene on the viewing screen it could be detected that the door opened, and a light-garbed figure walked through it.

"Who is that?" asked Morlin. "No one has come in since I've been here. It must be a longer time past than that, Hardy."

"Watch what happens," said Hardy, feeling an unreasonable foreboding.

In silence, the two watched. The figures, whoever they were, gesticulated and appeared to be talking. This continued for a few moments, then the third figure left through the laboratory door, apparently slamming it violently.



Something could be seen to fall from the wall of the laboratory.

Hardy breathed a sigh of relief and snapped the machine off. At least, he thought, nothing terrible had happened this time. And he had an incident that even Morlin should be able to identify.

"What now?" asked Morlin.

"You'll have to wait a moment," said Hardy. "I'm going to adjust the machine properly."

Morlin stood idly by while Hardy fiddled with the machine to gain time. That his actions might not seem too purposeless, Hardy actually did make an adjustment, one that would enable him to see the street entrance of the Morlin Laboratories rather than his room on the top floor. Then the prophesied incident occurred.

Some one knocked at the door.

"Come in," said Hardy.

Rhonda, dressed in a light laboratory smock, entered, with a sheaf of calculations in her hand. She looked at Morlin, then at Hardy, and then turned as if to go.

"What's the matter, Rhonda?" asked Morlin. "It's just a demonstration; you can watch, too."

"I'd rather not," said Rhonda. "I'm pretty busy with my work."

"Look here, Rhonda," said Hardy, "don't act like that."

"Why not?" she asked.

Again the unreasoning anger seized Hardy. He forgot about the machine, about everything but Rhonda. But he wouldn't let it come out. He froze it inside of himself.

"Because I don't like it," he said, as icily and ridiculously as any one could.

"What are you two quarreling about, anyway?" asked Morlin, in bewildered puzzlement.

THE QUESTION was to remain unanswered, however. Rhonda suddenly seemed to tremble. Her face took on a tight look.

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"I'm going home," she announced curtly. She turned and walked rapidly through the door, slamming it after her. As the door closed Hardy's framed photograph of Gustav Mahler of the Lorentz-Maxwell-Mahler equations fell from the wall with a crash.

The shock brought the scene on the screen to Hardy's mind. Forgetting everything else for the moment, he spoke to Morlin.

"That scene," he said, "and the picture falling; did you recognize it?"

"Just temper," said Morlin. "I wonder what she's got into her head now. You two must have been quarreling."

"No," said Hardy, "I didn't mean that. I meant, that's the scene you saw on the screen, by anticipated potentials. You were looking at the future, and that was it."

Morlin looked at him incredulously.

"You mean?" he said. Then, "It's absurd!"

But Morlin's voice was half believing. Hardy quickly turned on the machine, as he had readjusted it.

"It isn't absurd," he said. "You saw it for yourself. Watch, now. I've adjusted it to show the front of the building. We'll see it from here, and then go down and check up on what happens."

Morlin and Hardy gazed tensely as a flickering green image took form on the screen. There was no doubt about it; it was a street scene. There was a tall building which might well have been the Morlin Laboratories. Through the street whirled the miscellaneous vehicular traffic of the city. That was all, for the moment. Then, before the two men's eyes, took place that which made Hardy cold with fear.

Out of the door of the building hurried a figure, and started rapidly across the street, as though oblivious to the speeding motors. Two figures ran after

the first, emerging from the door as the other left the curb.

Hardy and Morlin could see the first one to emerge glance around, as if cognizant of a warning, or else observing for the first time the traffic surrounding it. One of the other figures rushed out toward that one. Then a car seemed to bear down out of the corner of the picture. The rushing figure reached the first; the car seemed to cover them; one was thrown free. Then the screen went blank.

Morlin stared at the blank screen in bewilderment.

"What does it mean?" he asked.

"A connection——" commenced Hardy.

Then in a flash of prescience, he took the scene in.

"Rhonda," he gasped. "Perhaps—perhaps——"

He rushed to the elevator, followed by Morlin.

As Morlin and Hardy reached the street, the scene lay before them. The bewildering traffic was there, and hurrying into the street, the figure of Rhonda, and the unseen car bearing down upon her.

Hardy knew what to expect. If only, it flashed into his mind, if only the

figure flung free might be Rhonda, and he be the one under the wheels of the car. Almost quicker than thought he had reached her. He pushed her from him, then glanced to his left. The car seemed to hang in the air before him, enormous. Then it suddenly struck. There was a numbing blow, and blackness.

When Hardy regained consciousness at the hospital, everything seemed very quiet. He was tired, but not, it seemed, in pain. Or perhaps, he thought, he was drugged, and would feel the pain later. But his mind was very clear.

Rhonda and Morlin were there, Rhonda at his side. She seemed very beautiful. Then he knew why she had wept at the hospital, why she had later been curt to him, but had still stayed with him as his assistant. And he knew why he had been angry with her, and wanted to strike her. All was so clear to him now. It was because she had loved him, and because he had loved her.

Then there was the machine. Was Morlin convinced, now, he wondered? And was the machine a thing of evil, that it prophesied only ill? Fantastic thought. But he did not greatly care. That he would know later.

