

# Hidden *in* Glass

By Paul Ernst

*THE spectroscope, with its glass prisms, has analyzed the material constituents of sun and stars, has told of their motions. For years glass lenses have given us the life history of microscopic creatures and of distant orbs in the heavens. Wonderful things can be done with glass, as witness what the hero of this short story gem performs. The author introduces a completely new field of investigation for the enterprising detective. Science enters more and more in the detective's successful solution of problems. These new wrinkles are surprising, but not impossible.*

AS Professor Brainard sat before his desk, he clenched the latest edition of the *Scientific Universe* savagely between his hands as though he longed to feel a human throat there instead of the insensate paper. His eyes were staring so that a ring of white showed around each dilated pupil. His fingers, tipped with ragged, neglected nails, were trembling with righteous indignation.

Willis was attacking him again—Willis, who seemed only to live for the opportunity of publishing something satirical and stinging in the journal, that should make the rest of the research world look up and laugh.

He opened the pamphlet again and read some of Willis' shrewish article:

"The latest theory of light refraction advanced by one of our number is almost as fantastic as his less recent ideas on molecular activity. Geometry is one of the oldest of intellectual pursuits; and the supposition that new properties might be discovered in the relations of curves and angles—unless one enters the impossible realm of the fourth dimension!—is hardly credible . . ."

The sober looking journal shook in Brainard's hands.

"The fool!" he exclaimed aloud. "The shallow, cocksure fool! And how does he know but what I *have* discovered the secret of the fourth dimension!"

The words of the article recaptured his attention: "We can only ask again for mechanical proof," it ran on, as though answering him audibly. "It would be easy for our distinguished fellow research worker to substantiate his claim by having a sheet of glass ground

to his mysterious formula. Since he will not do this we can only conclude that, although once a brilliant physicist, he has lived and worked too long alone, and has let his mind stray over the line of the real and into the territory of the unreal . . ."

That was Willis—the most bitter and virulent contributor of all the group who kept the *Scientific Universe* alive, and who too often squabbled and threw rhetorical mud like children. But this time he had stung too hard! That insinuation of unsound mentality was not to be borne!

Brainard threw the paper to the floor and stamped on it as though it could be hurt by his heels. Tiny flecks of white appeared on his lips. Senselessly he caught up a heavy glass ink well and threw it against the wall in front of him. It fell to the floor with one edge chipped off, leaving an irregular splotch of ink and a jagged dent in the plaster between the two front windows as testimony to his insane violence of temper.

Glaring at the cube of glass on the floor, he gradually resumed control of himself, though his rage was no less intense for being colder and more cunning. A speculative look appeared in his eyes, and again he pounded on the desk top at slow intervals as though keeping time with his fist to the strain of some persistent thought.

At last, still staring abstractedly at the glass inkwell, he smiled. It was not a pleasant smile!

"So he wants proof!" he said aloud. "He wants proof—this man, who as good as calls me insane! Well—he'll have it!"



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MOREY

*And now, apparently without the touch of a human hand, the lid was raised. . . . A man scrambled from the box, his clothes smouldering and his face purple from strangulation. . . .*

He swung around to face the acid stained desk, and delved among the litter there for a pad of paper and a pencil. For the rest of the morning, through lunch hour and late into the afternoon, he worked in blind concentration, filling sheet after sheet with angles and curves and parades of algebraic symbols. Now and then he glanced at a typewritten slip on which were cabalistic looking equations. These were woven in with other equations and geometric designs until at length he seemed satisfied.

The tangled results of his figuring were swept into an untidy pile on his desk; and he grudgingly left his task for a few moments while he went downstairs to the dinner his housekeeper had prepared. As soon as possible he returned and, with square and drawing instruments, began to concentrate in one design the sum of all the scribbled sheets.

A geometric figure gradually emerged—a thing of flat curves and shallow angles, through and across which marched rows and rows of fractional dimensions that would guide workmen in duplicating in glass the abstract thought of a mathematical mind. The light of dawn was just appearing when the drawing was finished; and with a sigh he leaned back in his chair and snatched a few hours of cramped sleep.

Immediately after waking he took his drawing to the offices of the largest lens and optical factory in the city and spent the morning explaining the intricacies of the object he wanted ground to specification. Then, with crafty precaution that no one group should have complete knowledge of his discovery, he went to a rival lens company with the precious typewritten slip containing his original equations. Here, too, hours were needed for a full explanation of the thing he wanted made—a sheet of glass about the size of a dinner plate, but of irregular outline and uneven thickness.

Returning home he muttered aloud to himself of the proof that Willis was soon to have. And at the sound of his voice, and the look in his staring eyes, people moved away from him in the streets and turned to gaze after him as he passed.

**P**ROFESSOR WILLIS had his laboratory in the far end of a great storage yard owned by the industrial company that retained his scientific services. The yard was surrounded by a ten-foot fence capped with strands of barbed wire; two watchmen went their rounds every night to guard the merchandise piled over the ground; and every precaution was taken to make sure that no one entered who had no business there.

Nevertheless, on a starless night, about two months after Brainard had given his two curious orders to the glass factories, Willis' laboratory caught fire and burned to the ground.

Willis was frantic. In the midst of an important and engaging experiment on molecular disintegration, he was barred indefinitely from further work. All his equipment was warped or cracked by the heat of the fire, and to replace it would be a matter of weeks. Furthermore he knew of no other laboratory outfitted for his needs—but one. That was owned by a man from whom he hesitated to ask favors—a man whom he was uncomfortably aware of having attacked vindictively in a late scientific article!

But next morning, while he was brooding impatiently over his ill fortune, his phone rang and a solution was offered to him.

"Willis?" came the harsh voice of his rival, Brainard, "Hear you had a fire last night." A pause. "I called you up to say that I'm going away for a month on a vacation, and you can use my laboratory for your molecular work if you want to. It's got all the stuff you need, and no one will bother you . . ."

Willis chewed on the end of his cigar. He was very much averse to taking favors from this man. Not only did he dislike him, but also he feared him! Lately there had been a disquieting look in the fellow's eyes when they rested on him.

However, if he were to be away for a month, it would be a waste of opportunity not to use his equipment. He accepted, thanking his rival rather awkwardly. The illogical apprehensions that set him to wondering at the unexpected generosity—the unreasonable suspicions that some motive lay behind the invitation—were dismissed; and he prepared to gather up the few effects spared him by the fire.

Brainard, at the other end of the line, hung up the receiver and rose wearily from his chair. His clothes were muddy and torn; and on the back of one hand there was a long scratch that might have been caused by the barbed wire of a storage yard fence. But his lips were shaped to a smile, as if at the thought of some plan that was developing to his entire satisfaction.

Willis dreaded meeting his host as he came over that evening to install himself in the borrowed laboratory; but his nervousness was comfortably dissipated by the fact that Brainard had already gone, leaving a curt note of welcome and a set of duplicate keys with the housekeeper.

The servant, an elderly woman with thin lips and blurred gray eyes, handed over the note and the keys, and prepared to leave. She, too, was taking a vacation while her employer was away. Willis would be absolutely alone in the big house, half of which was Brainard's workshop.

He had planned, after a casual look at the laboratory, to go back to his own home and return in the morning. But this he found himself unable to do. For, temptingly laid out as punctiliously as though arranged by his own hand, were all the instruments he needed for the continuation of his experiments. Brainard must have kept up with his activities astoundingly, to have duplicated his equipment at such short notice!

A touch led to a little more precise arranging, which in its turn drew him into the beginning of one of those heedless spells of concentration that had preceded many a night of work. Soon he was moving swiftly about the chamber, oblivious to time and all else but the array before him.

Just once he was momentarily interrupted. A slight scraping noise came to his ears. Confused by the effort of tearing his attention away from his work, he glanced around the room. There was nothing unusual to be seen.

Striding to the door, he locked it and slipped into place a heavy bolt that worked from the inside only. Then he fastened the front windows securely and returned to the long table, sure that there was no way in which he could be interrupted. The vague fear of Brainard, that had been awakened again at the sound of the odd noise, was submerged in the fascination of his experiment.

On and on he worked over the task that would never be completed by his hand. Time was lost; and it might

have been moments or hours later when he half turned—to see something behind him that brought a startled shout to his lips!

The cry was cut off like a slashed cord as something crashed down on his head.

**T**HE sole witness in the investigation of the murder of Professor Willis was unable to recall the exact hour at which he had heard that muffled cry from behind the closed windows of the Brainard home. He only knew that it was very late at night, that he had notified a policeman at once, and that, in less than two minutes, they had forced a way in and were exploring the house. No one was found, although the witness insisted that he had heard a slight noise as they approached the door of the laboratory. This, however, was disregarded; after breaking in the door a thorough search of the big room proved it to be empty of any living thing.

On the floor was the body of Willis; and no medical examination was necessary to tell that he was dead. Obviously, also, he had been murdered; but in spite of the quickness with which they had entered, there was nothing to tell where the murderer had gone or how he had managed to disappear so rapidly.

Careful not to touch the body, the officer gazed at it curiously. It lay, with eyes staring fearfully and head battered in as though hit by a club, near an odd object that was drawn up next to the wall.

This was a large glass box, about six and a half feet long by four and a half feet square, a contrivance that inexplicably suggested a plate glass coffin. A glance showed that it was empty. He could look through it and see the wall behind as clearly as though gazing through a freshly polished window.

Using the phone on the desk, he called headquarters, careful not to leave the room for an instant until an examination could be held. Then he settled back in his chair to wait until Blair, or some one, could come with the night squad. In a short time after he phoned, the squad arrived, with Blair in charge.

Each detective, it is said, has his own peculiar methods of solving crime, just as artists have their own individual ways of designing a picture. The method of big, slow-going Blair was apt to be dangerous to himself, in that he insisted on working absolutely alone in the scene of violence; although in this case certainly no one could have foreseen danger to the most solitary of investigators!

He irritably accepted the presence of the coroner till the body had been examined and removed. Then he instructed his men to go over the house, and set himself to the task of searching the laboratory. But first he fastened the shattered door by propping a chair under the knob to make sure he would be let alone while he combed over the room for clues.

He read and reread the note from Brainard that accounted for Willis' presence in another man's house. Knowing nothing of any enmity between the two men, he saw in the note and duplicate keys only a hospitable offer from one scientist to another in time of need.

Methodically he began to search the place. Examination of the splintered door told him that the room had been securely locked from the inside by the unfortunate scientist before he started the midnight experimenting. The windows were also tightly fastened and showed no signs of having been tampered with. The first mystery to be solved, it seemed, was how any one could

have entered the room while Willis was there at work!

He considered the chance that Willis might have locked himself in with some other person, an assistant perhaps. But that was proved impossible by the inside bolt on the door. No one could leave the room and relock the bolt from the outside. This fact also extinguished the momentary idea that Brainard himself, with his own keys, could have entered and left the laboratory that night.

Finally dismissing the problem of entrance as something that might later be solved by carefully sounding walls and floors for a secret doorway, Blair set stolidly to work to examine the contents of the room in search of any chance hints that might present themselves.

The rows and rows of test tubes, drawing instruments, and delicate electrical apparatus told him no story. The desk drawers revealed nothing relevant to the case. Puzzled, he stared absently at the huge glass box that ranged along one wall beside the dark stain on the floor where the body had been found.

The box, too, told no story. It was empty. As he looked through it the wall showed clear on the other side; and as he came nearer he could see the floor through it with equal ease. He tried to lift the lid; but, as he tugged at it, cautiously for fear of somehow breaking it, he found that it did not move. This in itself was mildly perplexing as he could see no evidence of a lock or catch of any kind in the clear glass front. Along the back ran a heavy steel strip, which reinforced its hinges, but in the front there was no speck of metal visible.

The possible purpose of the box was beyond him. Perhaps it was designed for some sort of aquarium, though why even the most scientific of fish tanks should have a lid over it was puzzling. Looking through it he observed that there were spaces around the hinge bolts near the top large enough to admit air in case the contrivance really was used for an aquarium.

However, he could not see that any light was shed on the murder of Professor Willis by the presence of one more strange scientific instrument in a room full of such things.

Shrugging indifferently, he turned away from the empty glass box. . . .

The next instant he received a smashing blow on the back of the head, and fell in almost the precise spot where the body of Willis had lain before him!

**A**T six o'clock in the morning the detective, Rand Hardy, was roused from his comfortable bed by a phone call from headquarters. Half an hour later the wispy little man, with the graying hair and the peculiarly blue eyes, was listening to a tale of two men struck down in an empty room which in each instance had been locked from the inside. The first, Professor Willis, was dead. The second, Blair, was in the hospital with a fractured skull.

At the end of the short, and not very helpful, account of what had happened, Detective Hardy nodded and went out into the bright morning sunshine. His first trip was to the hospital where he asked to see Blair. Here he met with no success in his crusade. Blair did not recognize him and was weakly delirious. Babbling sentences poured from his lips, ranging from broken snatches of childhood reminiscence to repetitions of words uttered the day before.

One occasionally repeated phrase, however, made

Hardy frowned attentively. This was an unintelligible reference to a glass box. There were no elaborations on the theme, merely the words—the glass box—murmured over and over again.

Puffing absently at an unlighted cigarette, he left the hospital and went to the Brainard home.

"The door was locked both times?" he asked Harris, a younger man, dark and taciturn, with whom he often worked.

"Yes. From the inside," said Harris. "Willis had fastened it with this bolt you see, and Blair had propped a chair under the knob so tightly that we could hardly force the door open."

"You're sure it would have been impossible to get into the room?"

"In the ordinary way, yes. Perhaps there's a secret entrance," he shrugged. "But we've sounded walls and floor and found no trace of such a thing."

"Have you any theory at all of what might have happened?"

Harris hesitated. "Well," he said finally, "the house was entered too soon after the murder of Willis for the murderer to have escaped. And the second time a man was knocked on the head here, the building was covered by half a dozen of the force, and no one could have possibly left the laboratory."

"Then you think whoever did it is still in the house?"

"Hardly that," said Harris. "My idea is that Willis and Blair weren't done in by anything human at all—by some mechanical thing." He pointed to the racks of apparatus that lined the walls. "I'm no scientist, so I don't know the meaning of much of this stuff. But it occurred to me that some one of these things might be an innocent looking kind of death trap. That big glass box, perhaps . . ."

With the words, Hardy turned to stare. The glass box! He remembered Blair's repetition of the phrase in his delirium.

"What do you suppose it's for?" he exclaimed.

"Haven't an idea," said Harris. "It's empty—but I can't help thinking it has some significance. Both men were struck down beside it, in the same spot. Possibly there's some kind of spring arrangement in the floor there, and when a man stands on it his weight is enough to release the force . . ."

"Have you tried it?"

"No-o—" said Harris slowly, "I haven't. That would be a good deal like sitting in an electric chair to see if the current is turned on!"

Carefully avoiding the fatal spot in front of the box, Hardy walked around it, gazing at it intently. Had there been any mechanism inside, it could have been plainly seen.

"Let's test out your concealed spring theory," he said.

Harris started promptly for the spot in front of the box marked with the dark stains on the floor. Hardy caught his arm.

"Wait a minute, young fellow. You're married, with a family. I'll stand there myself—and then, if you're right, there won't be any widows and orphans in this business."

Deliberately he walked over the section of the floor that might cover a deadly concealed spring, and waited to see if he would be the third to fall with a cracked skull.

Nothing happened. Methodically he shifted his weight from side to side; but no ominous, unguessable powers were released.

"That seems to rule the box out," he said, his voice casual. He sat down before the desk and stared at the open front windows where the sun was streaming in on the bare wood floor.

"After all," he said, thinking aloud, "it's not likely that any mechanical force did for Willis and Blair. That's far-fetched and complicated. No, I think a human hand held the club, or whatever it may have been, that cracked the heads for them."

"But if that's the case," protested Harris, "the murderer would still be in the house! He's had no time to escape. And all our work has proved that there are no secret doors or compartments where he could be hiding."

"It does sound improbable," murmured the older man. He turned again to gaze at the glass box that had been mentioned in the delirious babble of the second man to be stricken down beside it.

And suddenly, as he gazed, his eyes took on a colder blue and his lips shaped themselves to a soundless whistle. For, looking through the transparent glass walls, he noticed a curious thing.

The wooden baseboard that surrounded the room and that presumably extended along the wall behind the box—could not be seen through the clear glass! It came up to each end of the box and then disappeared!

The obvious conclusion was that, able to see through the box and still unable to see any trace of baseboard—there was no baseboard there to be seen! And as it was a foot and a half broad, if a section of it had been removed, it might provide the secret way by which some one could enter the room in spite of door and window locks.

"Help me shift this box away from the wall," he said abruptly to Harris. "I want to look behind it."

The combined efforts of the two men could not move it an inch. Panting, they gave it up.

"Call a couple of the boys from downstairs," commanded Hardy. But two were not enough. Two more had to be summoned; and the six of them ranged themselves at side and ends of the incredibly immovable glass box.

"It must be fastened to the floor!" exclaimed Harris.

"No, there it moved a little. It's just kind of heavy."

It was indeed heavy. The six of them were barely able to slide it a few feet over the creaking, protesting floor boards to a space in front of the sunny windows.

But as the box was moved away from the wall, Hardy stared in amazement. The baseboard was untouched behind it. In spite of the fact that he had been unable to see it through glass as clear as spring water, it was undeniably there and undeniably untampered with. Here was no secret way.

Completely puzzled, he sat at the desk again and looked at the box in its new place by the window. The sun, pouring warmly in, bathed it with light and reflected from bevelled edges in rainbow colored strips. It seemed to mock him, empty and innocent appearing.

And then he made another discovery.

About three feet above the lid there was an irregular splotch of ink and a jagged dent in the plaster of the wall between the two windows. As he looked straight at the box, apparently seeing through its sides, he saw the same irregular ink stain. It seemed to be on the wall directly behind the box instead of a yard above it!

"Well—" breathed Hardy.

Rising from his chair he walked to the side of the box.

Gazing down into it he saw the floor. But it was not the floor directly beneath it. Instead, he found himself staring at the tips of his own shoes a foot and a half to the side!

While Harris watched him wonderingly, he walked around the box, gazing through it from different angles.

"Have you opened this thing?" he demanded.

"Why, no," said Harris. "I tried to, and it seemed fastened somehow, so I let it alone. No use of opening it—you can look square through it now."

"No," corrected Hardy. "You can look through it, all right—but not squarely!"

"What do you mean, chief?"

"I mean that when I sit here at the desk and look through it—I see a patch on the wall three feet above it. And when I look down through the lid—I see the floor a foot and a half to the side. In other words, Harris, it's impossible to see *into* that box!"

"But it's clear as window glass," argued Harris.

"Clearer," Hardy agreed. "You'd think a speck of dust could be seen in it. But it couldn't be if you found your glance being deflected off at right angles!"

Wondering, the rest stared at the coffin-like thing that gleamed in the sun. And all saw the same strange phenomenon at the same instant—a thin wisp of bluish vapor that began to curl out from the open spaces around the hinge bolts.

"It's smoke!" exclaimed Harris, sniffing.

"From an empty box!" added another of the men.

But it seemed no longer empty. Gradually it was growing opaque so that it was impossible to see through it. The opacity deepened till it appeared suddenly to have been filled with milk.

And now, apparently without the touch of a human hand, the lid was raised. It opened as rapidly and evenly as though worked by some kind of machinery.

A man scrambled from the box, his clothes smoldering and his face purple from strangulation, and dashed for the windows. He was half out of one of them before they could reach him. A sheet of glass—about the size of a dinner plate but of uneven thickness and irregular outline—fell from his hands and smashed to pieces on the sidewalk below.

It took four of them to subdue and handcuff him; and with one glance at the gibbering thing that had once been Professor Brainard, Hardy picked up the phone and got in touch with the city asylum.

"HIDING in an empty box!" exclaimed Harris as, a little later, he and Hardy examined it.

The mystery of its weight was revealed at a glance: the top and sides were not ordinary flat sheets of glass, but were shallow triangles each plane of which was pronouncedly curved. At the thickest points the glass walls were nearly half a foot through, rendering the box enormously heavy. This, too, explained why the lid had seemed to be fastened down—its sheer weight made it a difficult task for one man to raise it.

Inside the box was a screw jack arrangement, so geared that the lid could be jacked up rapidly and noiselessly by any one lying inside.

Hardy pointed to the curved under surface of the lid.

"The reason for the smoke," he observed. "We just happened to put the box in the sun's rays, and the curved surface partly focused the heat like a burning glass. It must have been uncomfortable in there."

"But—hiding in an apparently empty box!" marveled Harris again. "And of course the chances were that no one would bother to open it when they could see at once that it was empty. So simple . . ."

"Simple?" repeated Hardy, raising his eyebrows.

"Why, yes. It's just a kind of prism effect. The principle of the periscope, you know. If you look into a glass prism your glance is deflected off at an angle."

"But the sides of this box aren't prisms," Hardy pointed out. "If they were—you wouldn't have any box left. You'd have a solid cube."

"Same idea, I guess," said Harris.

In response, Hardy stepped into the box and lowered the lid over himself with the jack. Harris gave a start of surprise. Though somewhat distorted by the curved glass surfaces, the body of his chief was visible.

"When Brainard was in it he was invisible," said Hardy after he had clambered out. "When I'm in it I can be clearly seen. There's more to this than meets the eye, Harris—a few details that I'll bet a lot of scientists would give their ears to know. Maybe the answer lies in that sheet of glass he threw out. . . ."

Puffing absently at a cigarette, he pulled the window shades to cut off the sun lest the box set the wood floor afire.

"Oh well, what's the difference," he said at last. "We've got our man. Let's get some breakfast."

A still unsolved riddle, the glass box gleamed blankly after them as they left the room.

THE END.

## What Do You Know?

READERS of AMAZING STORIES have frequently commented upon the fact that there is more actual knowledge to be gained through reading its pages than from many a text-book. Moreover, most of the stories are written in a popular vein, making it possible for anyone to grasp important facts.

The questions which we give below are all answered on the pages as listed at the end of the questions. Please see if you can answer the questions without looking for the answer, and see how well you check up on your general knowledge of science.

1. When was Neptune discovered? (See page 9.)
2. What principal features of the Sun are special subjects of observation? (See page 20.)
3. What is the relative mass of the earth and of Mercury? (See page 21.)
4. What is the albedo of a body, such as a planet? (See page 22.)
5. How may the operation of the brain be described? (See page 26.)
6. In what liability to, or rapidity of, degeneration of life cells does the brain tissue exhibit a difference from muscular tissue? (See page 38.)
7. What function is supposed to be lacking in the frontal lobe of the brain? (See page 38.)
8. In what part of the brain are the speech centers supposed to be? (See page 39.)
9. Have wars led to any developments of a useful order? (See page 45.)
10. What is the temperature of the sun on the surface and in its center? (See page 47.)
11. What is the Berserker madness, a psychological phase of former times? (See page 51.)
12. What is the meaning of the word "protoplasm"? (See page 81.)
13. What theory, referring to the force inherent in light, was evolved by Clark-Maxwell? (See page 81.)
14. Has any scientist thought that it is possible for life to pass from star to star? (See page 81.)
15. What is phototropism? (See page 86.)