

STARTLING STORIES

Vol. 2, No. 3

CONTENTS

November, 1939

A Complete Book-Length Scientifiction Novel



THE FORTRESS OF UTOPIA

By **JACK WILLIAMSON**

On a Lifeless Mystery Satellite, Five Lone Mortals Summon Secret Forces of the Citadel of Science to Free the Earth from the Doom of the Dark Nebula! - - - 14

Other Unusual Stories

THEY CHANGED THE WORLD	Jack Binder	90
<i>A True Picture-Story of the Life of Heinrich R. Hertz</i>		
THREE WISE MEN	Lloyd Arthur Eschbach	92
<i>A Time-Traveling Machine Explodes on a Millionaire's Doorstep</i>		
A MARTIAN ODYSSEY	Stanley G. Weinbaum	106
<i>A Scientifiction Hall of Fame Story</i>		

Special Features

MEET THE AUTHOR	Jack Williamson	13
GUEST EDITORIAL	Ralph Milne Farley	89
THRILLS IN SCIENCE—Thumbnail Sketches	Mort Weisinger	102
SCIENCE QUESTION BOX	Questions and Answers	113
THE ETHER VIBRATES	Announcements and Letters	114
SCIENTIFIC CROSSWORD PUZZLE	A Brain-Teaser	116
REVIEW OF SCIENCE FICTION FAN PUBLICATIONS ..	The Editor	126

STARTLING STORIES, published bi-monthly by Better Publications, Inc., N. L. Pines, President, at 4600 Diversey Ave., Chicago, Ill. Editorial and executive offices, 22 West 48th St., New York, N. Y. Entered as second class matter September 29, 1938, at the post office at Chicago, Illinois, under the act of March 3, 1879. Copyright, 1939, by Better Publications, Inc. Yearly \$3.00, single copies \$15; foreign and Canadian postage extra. Manuscripts will not be returned unless accompanied by self-addressed stamped envelope and are submitted at the author's risk. Names of all characters used in stories and semi-fiction articles are fictitious. If a name of any living person or existing institution is used, it is a coincidence. Companion magazines: Thrilling Wonder Stories, Strange Stories, Popular Western, Thrilling Mystery, Thrilling Western, Thrilling Detective, Thrilling Adventures, Thrilling Love, The Phantom Detective, The Lone Eagle, Sky Fighters, Popular Detective, Thrilling Ranch Stories, Thrilling Sports, Popular Sports Magazine, Range Riders, Texas Rangers, Everyday Astrology, G-Men, Detective Novels Magazine, Black Book Detective Magazine, Popular Love, Masked Rider Western Magazine, and West.

Thrills in SCIENCE

Thumbnail Sketches of Great Men and Achievements

By **MORT WEISINGER**

THE WORLD MOVES ON

THE vast, soundproof room was as silent as a vault. Its main piece of furniture was a long, oaken table. On it a pair of slender, crooked candles flickered eerily, casting weird shadows on the walls.

Around the table sat six masked men. Behind the black masks a dozen gleaming eyes blazed angrily. The six pairs of eyes had a common human target—the nervous, bearded astronomer standing before them.

The seventh man, Galileo de Galilei, stared apprehensively into the tapering flame of one of the candles. As the blue-white tongue licked and writhed in a dance of light, the bearded astronomer seemed to see an image form there. A tall, defiant figure resolved itself into view. It was a human being, lashed to the stake. His captors, thin-lipped, cruel, stood by impassively, heaping fuel to the fire. Savagely the roaring flames enveloped their victim in a fiery shroud . . . and soon the corpse was as charred as the wooden stake to which it had been fettered.

Galileo mopped his feverish brow and stared hopelessly about the great room as he strove to forget the vivid picture recalled to his mind. So they had burned Giordano Bruno, an astronomer before him, at the stake. For Bruno had dared to teach the heretic theory that the Earth is not immovably fixed in the center of the Universe, that the Earth was not the big shot of the Solar System. That belief was contrary to the teachings of science. And, most important, it refuted the Bible. So the law had decreed that Bruno, the free-thinker, must burn.

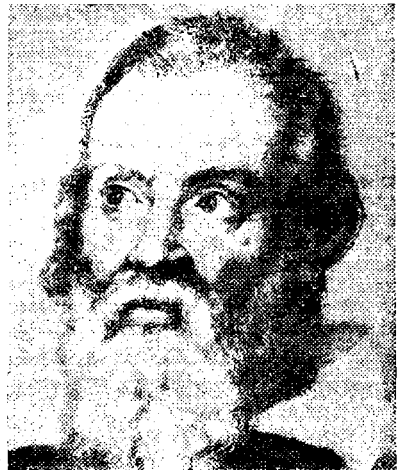
Galileo's eyes shifted pleadingly over the faces of the masked men surrounding the table. He encountered only blank, stony stares. Still not a word had been uttered by anyone.

Galileo bit his lip. If they had burned Bruno at the stake for daring to tell the truth . . . such a little bit of the truth . . . what would happen to him? His discoveries revolutionized all existing concepts of astronomy. They proved to the world that the Universe was vast, cluttered with countless stars and planets and satellites. And the Earth was merely a cosmic drop in the bucket. Man—man was nothing—as unimportant as a grain of sand in the ocean's bed. And if man was nothing—what was the power of the Church? That was why they would destroy him.

Galileo shifted the weight of his body

from one foot to the other. Would that he had never constructed his telescope, explored the mysteries of the heavens, studied the revolutions of the neighboring planets.

Most certainly, Galileo would unhesitatingly have given up his life rather than have



Galileo de Galilei

foregone the thrills his magic optical tube had captured for him. The thrill of being the first man to discover sun spots . . . the first man to see Saturn's rings . . . Jupiter's four largest satellites. . . .

But Galileo lived in the dreaded and dark days of the Inquisition. Sweet, merciful death he could face swiftly, even eagerly. He could die for his principles. But how many men can brave the ghastly unknown? The insidious, diabolical tortures of a group

of fanatics, expert in wrenching from a human body its most inner secret, its last audible breath. Galileo had seen some of the poor, miserable wretches that had survived the torturers' arts. Not a pretty sight. And now he himself stood before the leaders of the Inquisition, awaiting judgment.

"Galileo de Galilei," the chief counsellor addressed him. "we have examined your books minutely. We have been deeply shocked by the falsehoods contained therein, and we have come to the conclusion that your teachings are vicious blasphemies, entirely unsupported by scientific findings!"

The masked counsellor paused for a moment, the better to let his dramatic accusation seep into the fogged brain of his defendant . . . the defendant who didn't have a chance.

"Falsehoods?" Galileo roared back at his accuser. "Unsupported findings? I have stated that the world revolves about the sun on its own axis—just as I have seen is the case with the satellites circling Jupiter. The sun does not circle the Earth every twenty-four hours. Such an immense orbit is absurd!"

"Silence!" thundered the voice of the leader. "You lie. And unless you confess your errors and renounce your writings for all the world to know—" He gestured meaningfully in the direction of the adjacent room—the torture chamber.

Galileo shuddered. Then he sucked in his

breath, clenched his fists. He'd tell them—

The chief counsellor leaned forward, divining Galileo's forthcoming outburst.

"Think, Galileo de Galilei," he warned. "Not the stake—not the ax—but the torturers. . . . Swear by God that your teachings are false, that the Earth does not move about the sun, and you will go free!"

Galileo buried his face in his hands. He was trapped. Slowly, hoarsely, he began his denial of a lifetime's work. Staring wrathfully at his Inquisitors, he told them:

"I swear that all my teachings are false . . . I beg forgiveness for having deceived my fellow men . . . The Earth does not move about the sun. . . ."

A cold, superior smile illumined the gaunt features of the masked men's leader.

"You are forgiven, Galileo," he said. "And heed well that you do not blaspheme again."

Galileo stifed an oath, half-pivoted about and faced the wall.

"EPPUR SI MOUVE"—"None the less, the planet moves," he muttered almost inaudibly, his face livid with rage. And then the astronomer bowed mockingly to his audience and walked into the clean air outside.

Had they heard him? If they had, then he had won. If they hadn't, he'd lost. But win or lose, Galileo knew that future civilization would reach a verdict in his favor. For the world moves—on!

LABORATORY LIFE

THE olive-skinned Luigi Galvani pointed an acid-stained finger at the metal tray on his laboratory desk. A dead, dissected frog lay there, its ventral surface neatly split open, all the vital organs exposed to view.

Professor Galvani lifted a scalpel from the machine to his left, tapped it against the wooden desk, and addressed his dark-haired companion.

"Now watch closely, Signor Volta," he said confidently. "I will repeat the experiment you have read about. I know it sounds incredible. But you will soon see for yourself!"

"Wait one moment," interrupted Alessandro Volta. He lifted the tray gingerly, carefully inspected the base. Nothing suspicious there. There was no need to examine the frog. It was as dead as the lamb they had had for dinner.

Volta shook his head at his smiling Italian colleague. "All right, go ahead," he grumbled at last. "Begin your experiment."

Silently, Professor Galvani waved his scalpel before his curious associate. Then he brought its shining, sharp point in contact with one of the strandlike nerves in the frog's left leg.

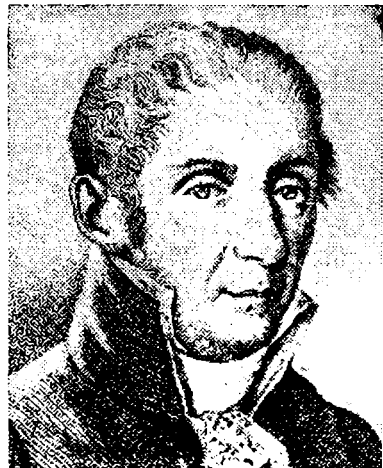
Instantly, the lifeless frog's leg kicked out, twitched convulsively. The leg had moved perceptibly, although the frog had been dead for days!

Alessandro Volta's eyes bulged at the phenomenon, as though the same scalpel had physically stimulated him too. He shook his head, totally perplexed.

"Do it with the other leg, please," he said incredulously.

Again the blade swooped down to inter-

sect a fibrous filament of nerve. This time the right leg of the frog stabbed out in a



Alessandro Volta

healthy, violent kick. It was uncanny.

"I can't understand it," Volta muttered. "Pray, Professor, how do you explain this?"

Professor Galvani smiled wisely, put back the scalpel on the machine on his left, put an arm about his friend's shoulder.

"It's simple, Alessandro," he explained. "Electricity exists in the tissues of the dead frog. My scalpel merely touches off that stored electricity, releases it in the form of energy in the frog's body. The electricity goes through the nerves of the frog's legs, results in a reflex action—a kick."

"In other words, you believe that the body of a dead frog contains electricity?"

"Si, my friend. That is it, exactly. All animals carry electricity."

"Do you know what I think?" Volta asked rhetorically. "I think your theory is preposterous. Electricity can only be produced by the contact of two different metals. That is a fact of which I am certain. You cannot convince me otherwise."

Professor Galvani smiled amusedly.

"Then how do you explain what you have just seen? That was no trick. And I assure you that the frog was one pretty dead fellow!"

Volta shrugged his wide shoulders.

"That I cannot answer, my friend," he said good-naturedly. "But I'll discover the answer—just as sure as this is the year 1800!"

Alessandro Volta left his friend's house, a deep problem haunting his energetic mind. The evidence he had seen for himself was no optical illusion. Certainly there was no supernatural explanation. There must be some good scientific reason to explain why a cold, dead frog should be able to kick vigorously.

Galvani's explanation he immediately discarded. Galvani was an anatomy professor who had only recently begun to dabble with electricity. And Volta knew from his many personal experiences that his associate's theory was much too far-fetched.

What then was the answer? He was baffled. It remained a mystery.

The weeks sped by . . . became months. But Volta had not forgotten.

Then, one day in his own laboratory, Volta suddenly realized the solution. The answer to the problem that had been plaguing him was simple. So simple it had eluded everyone's notice, even Galvani's.

The answer was this: In recalling the de-

tails of Galvani's experiment to mind, a scene he could never forget, Volta remembered that the professor had picked up the scalpel used to contact the frog's nerves from its lodging place—a machine!

That was the one smashing clue Volta needed to shatter Galvani's theory into limbo. If his deductions were right, then Galvani was wrong by a light-year. But first he would have to find out more about this machine. . . .

Back in Galvani's laboratory, Volta beckoned his amazed friend to his desk. He pointed to the machine standing beside it.

"What kind of machine is this, Professor Galvani?" he asked, his deep black eyes sparkling.

"Why, it's an electrical machine. I've been using it to make static electricity. Why do you ask?"

"Ah!" Volta exclaimed. "So I am right! Your scalpel rests on this machine. Obviously, the scalpel is electrified with some of the electricity stored in the machine. It is this electricity, transferred to the scalpel, that activates the frog's legs—not the release of 'electricity' in the frog's body! You've never realized this truth, my friend!"

Galvani frowned, started to protest.

"Wait, let us touch your frog with MY scalpel!" suggested Volta. And before the bewildered Galvani could protest, Volta had raced over to a jar, extracted a dead frog, split it in two, and applied his scalpel. There was no reaction. Volta had proved his rejection of Galvani's theory.

Inspired and thrilled by his analytical abilities, Volta used his discovery as the basis toward proving his own theory—that electricity is produced by metals. By connecting a series of two different metal discs, copper and zinc, separated by a piece of cloth soaked in sulphuric acid and water, he obtained a weak electric current—the first man ever to accomplish that feat in such a manner.

Next Volta joined a larger series of these metals and obtained a stronger flow of electricity. Volta had invented what was to be known as the "voltaic pile," forerunner of the modern storage battery! And all the result of a pair of twitching frog's legs! A pair of legs that will be remembered as long as the "volt" remains a key term in modern electricity.

RACING AGAINST LIGHT!

PROFESSOR ALBERT ABRAHAM MICHELSON tried to be calm, but instead he trembled. How could one be calm and cool when the most delicate experiment in the annals of science was about to be attempted?

The year was 1887. Several years before, Michelson had startled the scientific world by measuring the velocity of light, the fastest element in the universe, to an inconceivably accurate degree. He had shuttled a beam of light back and forth between two mountain tops in California, measuring its speed with a sensitive instrument, the interferometer, his own invention.

But that had been child's play compared to what he now attempted. He was trying to detect the infinitesimal influence on the

velocity of light caused by the Earth's motion through free space. Hendrik Lorentz, the famous European physicist, had calculated theoretically that this would be no more than 0.00001 of the actual light-speed! And Michelson had declared that he could

measure that effect with his instruments, verifying Lorentz's calculations.

Michelson was crazy! His task was impossible! That was the opinion of the European men of science. True, Michelson had won their respect by his ingenious method of clocking the speed of light. But now he was making a fool of himself. He had overestimated his mechanical technique, as those

monished Morley, his assistant. "Why, you're shaking all over!"

Michelson nodded grimly, controlling himself. By nature he was genial, smiling, but now he was a tense bundle of nerves. The experiment was started. A powerful light beam was sent through a series of mirrors mounted on a stone platform floating in a bath of oily liquid mercury.

A turntable operated by a powerful compressed-air motor periodically swung the entire apparatus at right angles, easily, effortlessly. Michelson had spent mind-draining months designing the various parts with a precision unknown before in the history of physics.

Finally the moment arrived and Michelson's taut fingers adjusted the eyepiece of the interferometer. Twin beams of light from the mirrors speared into the instrument. One went in the direction of Earth's orbital motion. The other went transversely to that motion. The latter, going **ACROSS** the ether through which Earth drifted, should lag a little from the one following the ether. And his interferometer would then show the difference, by the interference of bands of light and dark.

Michelson's reputation balanced precariously on the results his instrument would record. All the scientific world waited, many with derisive smiles, to see whether the brash American could accomplish what the Europeans had not even tried—because it was impossible. Michelson's soul, as well as his eyes, probed the interferometer that day. And he saw—

Nothing!

Not the slightest interference! He tried again, checking every motion, every screw, bolt and mirror. Apparently, the apparatus

(Concluded on page 128)



Albert Abraham Michelson

Americans were so prone to do. He was trying to play God and command light to stand still for him, as Joshua, a leader of Michelson's own race, had commanded the sun to halt, an age before.

"You must be more calm, Professor!" ad-