



His Vision

The True Story of a Boy Who Had a Big Idea and Followed It Through to Final Success

By ELLIOTT ARNOLD

THE only trouble with Philo T. Farnsworth's story is that it is out of time. It belongs to another day. It ought to be a hoary legend now and it's just twenty years old and still in the making.

It has everything the school teachers love—boyhood on a farm, the dreamy inventor, the years of struggle, success. It's the story of television and it all took place when folks whose names slip the mind for the moment did a lot of shouting about the frontiers being gone.

Farnsworth dreamed of television without moving parts when he was thirteen; a year later, still in high school, he invented some of the basic parts of electronic television. In 1927, when he was twenty, he took out his first patent, on an entire television system—not just one part—and Donald K. Lippincott, the radio engineer, called him "one of the ten greatest mathematical wizards of the day."

Today, at thirty-three, Farnsworth is vice president and general director of research of the Farnsworth Television & Radio Corp. Such organizations as American Telephone & Telegraph, Radio Corporation, and Philco have taken out licenses under Farnsworth patents. Foreign licensees include Baird Television, Ltd., of England; Fernseh

Philo T. Farnsworth training a television "eye" on a dance team. Above, he is seen at work in his Fort Wayne laboratory



Made Television

Aktiengesellschaft of Berlin, and T. C. Rethers of Australia.

The story of Farnsworth, a painfully shy man, starts with his grandfather, the first Philo Taylor Farnsworth, who established the Mormon community of Beaver City, in Utah, under instructions of Brigham Young.

Philo's father settled a farm there, and Philo grew up on it. When he was six he played constantly, not with wagons or tin soldiers, but with a toy dynamo and a tiny electric motor. One day he rigged the dynamo to the wheel of his mother's sewing machine, generating enough electricity, while she sewed, to operate the motor. His mother hoped he would let it stay that way for a while, but the boy's interest was too feverish. He took the motor apart and put it together again.

When he was twelve the family moved by

wagon train to Rigby, Idaho, and worked a ranch in the Snake River Valley. The place was the answer to a young inventor's prayer. It was littered with equipment, including a private light and power system, power-operated hay hoists, and harvesting devices that worked electrically.

The mechanical and electrical gadgets were total mysteries to all except Philo, who went for them with a wild shout of glee. He took everything apart and put it together again. He arrogated to himself the sole right to keep the equipment in repair, and it was no contested position, since no one else could do more than push the right button.

He had the equipment working so smoothly it got to be no fun at all. His family swears he deliberately put parts of it out of commission when things got dull, just so he could take them apart and fix it.

His folks had been hoping maybe he would be an artist, and optimistically had been feeding him violin lessons. He turned out to be a pretty good player, but it never became more than a relaxation. He is a good violin player today and is an expert pianist.

When his folks got wise to the planned vandalism of the machinery on the farm they thought they would put an end to it. They gave him a new chore to keep him out of mischief—operation of the gigantic family washing machine. But they didn't know their son. Farnsworth became fed up with moving the handle back and forth and rigged up an electric motor, winding the intricate coils of the armature himself, and soon had a power-operated machine. He was not yet thirteen.



The inventor watches the screen of an experimental receiver





A new idea takes shape on paper. Farnsworth was thirteen when he got the inspiration that has guided his work in television

Farnsworth, a very modest man, does not offer any of this information with the intention of trying to limn the early life of a genius.

"The only significant thing in all this," he says, "is that it gave me a background at a very early age of the elements of electricity, and gave me an incentive to study electric physics and, through the medium of popular magazines, a knowledge that there was such a thing as television."

The boy read everything he could lay his hands on that dealt with television, as it was being planned then, and finally he asserted to all who would listen to him, that the research experts were barking up the wrong tree trying to develop a television system by mechanical means.

The major experimenters were using mechanical whirling disks to scan the image. Farnsworth declared that this would get them nowhere, for the simple reason that the transmission of a satisfactory image required scanning speeds greater than any whirling disk could reach and maintain.

Electrons, he said, moved with the speed of light itself, and they could do the job if properly harnessed and controlled. That conception is the basis of today's electronic television—television with no moving parts—and it emerged from the head of a boy who hadn't yet started to shave.

"I had a theme for research which continued through the years as a guiding light,"

he says, "or as a direction for research and development; namely, the elimination of all moving parts from television equipment.

"The idea I had fairly well established in 1921 when I was thirteen, so that the moment I discovered tools—out of textbooks I mean—which would enable television to be done without moving parts, the invention seemed almost simultaneous; as a matter of fact, simultaneous with the discovery that there was an electron and a photo-electric effect.

"In 1922, when I was a freshman in high school, I made my first big invention in television—and it consisted of a means of producing an electric counterpart of

an optical image. At that time it was a daydream, a daydream only. I had no facilities for doing research. I had no money to buy equipment.

"All I had was access to a very modest school library, and my sum total of equipment for forming any definite practical idea as to the problem of television consisted of a static generator in the high-school physics laboratory, and an old Braun tube."

ONE of his high-school teachers, Justin Tolman, took a great interest in Farnsworth. The teacher and pupil used to hold long conversations on the molecular theory of matter, the structure and nature of electrons, and Einstein's theory of relativity. The teacher later said that young Farnsworth's discussion of the theory was the clearest and most concise he had ever heard.

One day after school Farnsworth started to draw on the blackboard. He worked for hours, correcting, erasing, and then he began to explain it to his teacher. It was his conception of an electronic television system.

The teacher studied for a long time, and then admitted it was beyond him. He gave the boy the most advanced textbooks on the subject he could think of, and told him to go on with his dreams.

Soon after the Farnsworth family moved to Provo, Utah, and young Farnsworth took some special courses in Brigham Young University. In (Continued on page 236)

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His Vision Made Television

(Continued from page 76)

1924, at the age of eighteen, he had fully worked out the concepts of electronic television, essentially as it works today.

His father died and Farnsworth had to put aside his dreams for a while and go to work. He started a small radio shop—and, ironically, it failed. He got a job in the railroad yards.

At this point his luck changed, however. He met George Everson and Leslie Gorrell, two California business men. They listened to him for a while, and agreed to put up \$8,000 and see what he could do. Farnsworth was sure his star was set now; he married a childhood sweetheart, Elma Gardner, and the couple moved to Hollywood.

Farnsworth turned the living room of his home into a laboratory. At one time the neighbors got suspicious of the strange young man and the packages he was carrying into his home and the sound of motors operating inside. This was during prohibition, and they were sure he was operating a still. They notified the police and the place was raided. The inventor, eyes blinking, finally convinced the police no liquor was being manufactured on the premises.

Money frequently ran low, and between problems Farnsworth had to beg his backers for more. In 1927 he had something to show for his work—his first patent, the one on the whole system of electronic television.

At one of the early demonstrations Farnsworth was asked by a banker whether he "saw any dollars in that pickup tube yet." Farnsworth answered by televising a dollar sign painted on a sheet of glass. The banker laughed and coughed up more money.

In 1928 Farnsworth gave a demonstration for the press in San Francisco and drew international attention to himself. Three years later he entered into an agreement with a large radio-set manufacturer, under which his research staff and much of his equipment were moved to Philadelphia.

At the end of that period he established his own laboratory there and carried on research until 1939. Then the plants were moved to Fort Wayne, Ind.

Farnsworth is the father of two boys, Philo, Jr., ten, and Russell Seymour, four. They live near Fort Wayne. Music is the chief interest in their home and Farnsworth has started to study counterpoint and theory.

He is a heavy cigarette smoker and a big-time eater. He is a good shot and a fanatic at auto driving. He races his car up and down the countryside when stumped at the plant. © New York World-Telegram.