

Man's Invention to Revolutionize Television

"The electro-magnetic spectrum has the blues." Those were the first words Max ever spoke to me. They are part of Bolinas Poet, Max Crosley's eulogy to the late Dr. Philo Taylor Farnsworth, inventor of electronic television. Dr. Farnsworth lived and worked in San Francisco, where in 1926, he created the first cathode ray tube, the forerunner of all TV tubes in sets today; and yet he is almost unknown even to his San Francisco beneficiaries.

"Athena weeps. Not one of you has been unaffected by this man. I watched all the news shows, national, local, and even the so-called educational channel. They never said a word. They owe it all to him and they never said a word. He right now is commanding your living room mind. You saw men on the moon right then because of him. And they nothinged him into nothing. When Picasso was wildly experimenting with duco cement, *this man was drawing with electrons*. I watched all the news shows and they never said a word." Max, in his deeply moving eulogy to Dr. Farnsworth, revealed to me a man so vast that he will pass into history along with names like Kepler, Newton, and Einstein.

Dr. Philo Taylor Farnsworth is born August 19, 1906 in Beaver City, Utah, son of a Mormon family whose ancestors fled the Mormon settlement in Nauvoo, Illinois with Brigham Young after the founder of the Mormon Church and translator of the Book of Mormon, Joseph Smith and his brother, were shot to death by an armed mob while awaiting trial on false charges. By 1920, Philo's father moves his family to Rigby, Idaho where Philo II attends high school. Young Philo spends every penny he can produce on magazines about electronics, chemistry, and mechanics, absorbing them cover to cover with uncanny understanding. In 1921 when Philo is a scant 14 years old he diagrams his idea for a television tube and receiver for his high school science teacher, Justin Tolman, on the blackboard of Tolman's classroom. Tolman photographs these diagrams and they are later used by Farnsworth as evidence against Radio Corporation of America's leading television scientist Zworykin, which resulted in Dr. Farnsworth's being awarded the patent rights.

All the scientific developments of television before Farnsworth's proposal employed a whirling disc two feet in diameter to 'scan' the image, but this system of mechanical scanning produces such poor results that television seemed years away from consumer access. Farnsworth's system of scanning with an electron gun eliminates all the mechanical parts of television sets, and because it moved with the speed of light, makes possible the TV sets we use today.

Not long after Farnsworth diagrams his idea for Tolman the Farnsworth family moves to Provo, Utah, where Philo enters Brigham Young University. While at the university, Philo completes his theoretical and mathematical models of this revolutionary idea and begins to think about actually building the first tube. But the death of his father cuts short his university education and, following an attempt to support his family by operating a radio repair shop in Salt Lake City, which fails, he goes to work in the Salt Lake City railroad yards of the Southern Pacific. Still in his teens Philo does not give up the idea for his TV tube and after a time his luck changes.

A San Francisco resident who had traveled to Salt Lake City to organize a community chest drive hires Philo to assist him in the work. Philo explains to George Everson his idea for sending pictures through the air like radio. Everson is so taken with the young Mormon and his futuristic ideas for sending pictures in the air that he moves Philo and his young wife to Los Angeles for his next community chest campaign. While the campaign is being organized, Philo and his wife Pem set up a lab in the dining room of their house in Hollywood. It seems prophetic that the invention which brought the Hollywood Movie Dream Machine to its knees was at least in part nurtured by the very powers that it would displace. It is 1926—prohibition—and the neighbors, in typical Los Angeles fashion, call the police to the Farnsworth house thinking that the strange activity there is the result of an illegal still.

After the campaign Everson arranges for Farnsworth to meet a group of scientists from Cal Tech in the offices of Patent Attorneys, Lyon & Lyon. Everson must have realized that raising money for an invention of the magnitude of Television would be easier than raising money for the community chest and his efforts produced definite results. Money for the construction of the first electronic television tube at a lab in Hollywood disappears so rapidly that the lab is moved during the same year to San Francisco where Everson succeeds in obtaining backing for this radical new project from James T. Fagan, executive VP at the Crocker Bank.

In the same prophetic way that Everson has funded the idea of pictures through the air in a Hollywood lab, it seems he intuitively knows that San Francisco will one day become the rival of the Hollywood back lot. Though the first motion pictures came from a small town in the East Bay around 1910-11, it is Hollywood that is destined to profit from these films in a commercial way. But San Francisco has the last word in seizing the idea of pictures through the air with her patronage of this incredible young man, just turned twenty.

On September 1, 1928, W. W. Crocker and Roy Bishop, officers of the Crocker Bank, called a news conference to announce that their protégé, Philo Farnsworth, in his lab at 202 Green Street, has successfully built and tested the first electronic television tube. The *San Francisco Examiner* carries the news on the following Monday on the front page, headlined "NEW ADVANCE IN TELEVISION," and the *Chronicle* on the front page of its financial section headlines the story and two column picture: "SAN FRANCISCO MAN'S INVENTION TO REVOLUTIONIZE TELEVISION." Quoting a section from the article:

W. W. Crocker and R. N. Bishop head local capitalists backing genius. The laboratory model he has built transmits the image on a screen one and one quarter inches square. It is a queer looking little image in bluish light now, one that frequently smudges and blurs, but the basic principle is achieved and perfection is now a matter of engineering. The sending tube is about the size of an ordinary quart jar that a housewife uses for preserving fruit, and the receiving tube containing the screen is even smaller.

But tragedy is soon to strike, not only Farnsworth and his fruit jar television and pictures through the air, but the nation and the world. The same front page of the financial section that brought the news of television revolutionized now brings news of the stock market crash, failing brokers, and collapsing banks.

Though the work does not stop, Farnsworth is forced to move his lab once again, this time to Philadelphia where he has joined forces with a large radio equipment manufacturer, so that all of his attention can be directed toward the work of building and perfecting his invention. Once again the incredible genius of this single man, and the devotion and craft of his assistants, his wife not least among them, brings forth practical results destined to change the world from a sphere of ignorance to an electronic global village.

By 1935 Farnsworth has again formed his own company and in the lab which he builds in Philadelphia he completes developing his invention—electronic television—pictures through the air. In the summer of 1935 at the Franklin Institute in Philadelphia, Farnsworth makes the first public demonstration of television that the world has ever seen. By October the English television scientist Baird has heard of Farnsworth's successes and invites Dr. Farnsworth to England to display his invention. The broadcasting equipment is set up at the fa-

Young Genius and Part of His New Black Light Machine



Philo T. Farnsworth holding the sending and receiving tubes of his new television set.

mous Crystal Palace in London and a signal is broadcast to a receiver 25 miles away. The English immediately recognize the implications of Farnsworth's work and move rapidly to strike a deal with him giving Baird the franchise to build the equipment necessary to bring into being the BBC Television Corporation. Of course Farnsworth is not the only scientist in the USA working on a television system and his announcement at the public summer demonstration bring cries of patent interference from such companies as Radio Corporation of America. But the evidence seems overwhelmingly in Farnsworth's favor and the patent rights given him in the court battles that follow the public demonstration also give Farnsworth the right to franchise his invention to the manufacturers who had made claims on his work. So in December of 1938 Dr. Philo Taylor Farnsworth forms Farnsworth Television and Radio Corporation which later becomes Capehart-Farnsworth Electronics Company, a subsidiary of International Telephone and Telegraph Corporation. This company franchised television not only to Baird's company in England, but to RCA and to Philco. The lab moves with the new company to Fort Wayne, Indiana, where both manufacturing and research facilities help make Farnsworth a household word by supplying the nation with the Farnsworth radio.

The year is 1939. The world is shocked and Europe reels as the Nazi hordes march across the borders of their neighbors to occupy and enslave. Now all the resources of the International Telephone and Telegraph Corporation, including Farnsworth Radio turn toward defense, and yet again the mind of the Beaver City genius, now only 34 years old, creates from streams of electrons and vacuum tubes invention after invention. Working with scientists from ITT, Farnsworth contributes to the English invention, *radar*. He goes on modulating, directing, synthesizing the elusive electron, building special purpose vacuum tubes, studying nucleonics: the structure of atoms. He investigates nuclear energy and probes the secrets of the equation, $E = mc^2$ —energy released by the fusion or reaction on the surface of the sun.

Meanwhile, secretly the United States has gathered a group of scientists together in Chicago at Stagg Stadium for the Manhattan Project. The results of that project are suddenly and without warning thrust upon the world at Hiroshima. Farnsworth has not helped to build the bomb, does not know of its existence until that fateful day, but he has given so much thought to nuclear energy for peaceful uses, that he now turns all his energy toward one last incredibly fantastic futuristic idea, electrical power from fusion. From the end of the war to his retirement in 1967, Dr. Farnsworth works with the same genius that at fourteen gave television to the world, toward an energy system so safe and so clean, so accessible, and so simple, that with its advent the energy needs of the world, and whatever lies beyond, can be completely satisfied for as long as man remains.

After his death in March of 1971, International Telephone and Telegraph in a press release made the following statement. "He conducted experiments on the peaceful uses of atomic energy and was issued several patents on generation and control of atomic fusion energy by electronic means." To say more is pure speculation but the correlation between the invention of electronic television and fusion produced electricity is undeniable. Some of the finest scientific minds in the world had struggled two decades with the problems of television yet they could not build a system that really worked until this Mormon farm boy at the age of fourteen singlehandedly resolved all the problems that the world's best scientists had not solved in twenty years of working. Is it not within the realm of possibility that this self same man has, in fact, working almost singlehandedly, solved the problems of producing electricity by the use of fusion while the rest of the world's great scientific minds have struggled for twenty years without results?

If fusion power by electronic means should ever become a reality the internal combustion engine, the West Virginia coal mines, the Middle Eastern Oil Fields, air pollution, and chemical rockets with moon landing capabilities will become as antique to us as silent films and dirigibles are to our fathers. Whatever the future holds for us, no one can deny that Dr. Farnsworth made Marshall McLuhan's Global Village, a world of instant communications, and access to information, a reality in our own time.

"Athena weeps. Not one of you has been unaffected by this man. His focused energy, his boredom toys, his rainbow dreams are your everyday fulfilled desires. How long will the electro-magnetic spectrum have the blues?" Thank you Max.