

[MUSIC PLAYING]

My father said, I ought to go to Boston Tech. And there was a kid named Tom Peterson who went east to Harvard. And when he came over in the summer, I said Tom, did you ever hear of Boston Tech? Well, he said, no. They changed the name, they moved it from Boston over to Cambridge, and they called the Massachusetts Institute of Technology.

[CHEERING]

And then he looked me right in the eye and said real loud, they only take smart ones!

[LAUGHTER]

I learned from that not to ever believe anything that a Harvard person tells you.

[LAUGHTER]

Well, it seems like yesterday I came over here in 1926 to look over MIT. I had been working in Schenectady, New York at the General Electric company, and was admitted as a graduate student in electrical engineering to work on motors.

It was during the course of his graduate studies in electrical engineering that Doc designed and developed the strobe. He needed a way to observe parts that moved so quickly that they were a blur, and it was for this purpose that he invented something new-- an incredibly brief, controllable, and repeatable flash.

I worked for three years on motors, and I suddenly realized, hey, there's a lot of things in the world that move. And I looked around, there was a faucet [INAUDIBLE] right next to where I worked. So I just moved the strobe over and took pictures of water coming out of the faucet. And that's the first picture I ever took, except for a motor.

And Edgerton found that there were other ways to study motion. By repeatedly flashing a strobe, he could create multiple images on a single photograph.

Now, there exists a [INAUDIBLE] picture-- whether the lights running 100 times a second, I got two big powerful strobe lights. Well, here comes the club-- see, it's accelerating, and you can plot a curve into the velocity versus time, and you get the [INAUDIBLE] information here [INAUDIBLE] the slightest bit interested in, such is the velocity of his tee.

[LAUGHTER]

Now, this picture was a fizzle. I normally throw away all my bad negatives, and I was just about to throw this out, and I thought, oh, I'll make a print of that. And it's down in the Museum of Modern Art in New York.

[LAUGHTER]

Supposed to be real art. I don't care-- that's all right, if they want to call it art, why don't you call it art. Well, I [INAUDIBLE] was more of an electrical engineer, because it's all done with electricity. You saw these [INAUDIBLE] slides around here-- they're all batteries and capacitors and electronic lamps.

[MUSIC PLAYING]

I know there's somebody come in here from MGM, and he says, I want a movie of throwing a custard pie through an electric fan. Well, I said, I'm a serious scientist. I'm not going to fool with any custard pies. Well, let's compromise on an egg-- what do you say?

The film was called, *Quicker'n a Wink*, and it won a 1936 Academy Award for MGM.

I always thought that my cat, in lapping her milk, curled her tongue up. But now it's revealed that she curls her tongue down. See? In other words, she brings the milk up on the underside of her tongue.

Now, see how smart you get when you go to the movies?

Years later, Doc and his colleagues added the finishing touch, matching slow-motion sound to high-speed pictures.

[PHONE RINGING]

[BELLS RINGING]

This was amazing--in the war, when we were having trouble with the Germans, and we wanted to know what they were doing at night time.

The year was 1938. Doc and his associates went to work on the top-secret project. The end result was 57,000 watt second strobe package, powered by 8 kilowatts, and weighing 3,700 pounds.

The value of the aerial strobe dramatically demonstrated the night before the invasion of Normandy. The photos showed little or no movement of enemy troops, indicating that the Germans were unprepared for the invasion.

The clouds were down about 1,000 feet, and the flash bomb couldn't use it at all, because they were designed to be working at 10,000 feet. So those pictures were useful. They were used all during the war.

The Atomic Energy Commission asked Edgerton and his associates, Germeshausen and Greer, to form a company, which later became EG&G, and to design a testing camera to analyze nuclear explosions.

And then suddenly one day, we had an agreement with the Russians not to have any more atom bombs. All my friends came around here and said oh, that's too bad, your company is going down the drain. Well, that was the best year we ever had, because all the people got up early in the morning and started thinking about other things to do. And there was all kinds of things to do.

Doc turned his strobe to the undersea world, where movement was sometimes imperceptible.

By having a movie camera that takes one picture every 20 seconds, and you can take things that happen slowly and speed them up. Now, I was trying to get these sand dollars to spell MIT.

[LAUGHTER]

They're very poor learners, very poor learners.

[LAUGHTER]

I asked him to bring some of those sand dollars back, because my grandson wanted to see them. Actually, it was me that wanted to see them, but that's all right. They have little round things-- they've got small feet on the bottom, so they can walk around.

Up, Eric, up! Raise them up! That a boy.

[LAUGHTER]

I got a telephone call that said there was some unknown man come in from France, named Jacques Cousteau, and nobody ever heard of him. But he's here, and could he come up and talk to you about underwater photography?

So he came in, and I found out he had invented the aqua lung. And he hadn't been at MIT more than a couple hours before we had a tank on his back, and he was testing my latest underwater strobe in the swimming pool. And that led to many, many expeditions on the Calypso, and a lot of articles in the *Geographic*.

Edgerton found that sonar could be used to make pictures with sound, just as photographs are made with light.

At Boston's Charles River, he developed and tested a whole new array of sonar devices. One called a boomer, or pinger, penetrates the underwater mud to reveal objects below. Another of Edgerton's sonar inventions is a side scanner, used to locate objects which project above the bottom of the sea.

I was in Athens with Cousteau on the Calypso, and he came in one day and said, is that side scan sonar is good for picking up a ship that's 1,000 feet long? Think you can find it? Well, I said, if I can't, we better go home. With a sonar, you ought to be able to find it in no time. It was a long ways from where anybody ever thought.

[YELLING]

And there it was, just as clear and sharp.

Hi, how are you?

When MIT has its open [INAUDIBLE], Dr. Edgerton makes thousands of copies of his famous milk drop pictures, and gives them away to what he hopes may be future students. The milk drop is probably the best known picture Dr. Edgerton has ever taken. But he is equally well-known as a superb teacher.

Now, we'll try to find it with the strobe.

And this disk is used in music for tuning instruments. You swing in a microphone, it changes the frequency of the light, you look at a disk that's run by a constant feed motor, and you can tell whether the girl's singing flat or sharp, or whatever it is. Some people can tell without this strobe.

[LAUGHTER]

If you have a particular interest in these things, we got here, come on down and run them.

[APPLAUSE]

Several years ago, I heard Jean Brown make a remark that she hadn't been married to Gordon very long before she realized that he had another love-- MIT. I, too, had the same experience when I married Harold. Unfortunately, it didn't take me very long to become enamored with MIT, myself. And so we've been a happy triangle ever since.

[LAUGHTER]

[APPLAUSE]

One of the first miracles that happened to me is when I was about five years old, and my father brought home a beautiful Jersey cow. And he let it in the barn, and my sister and I went in after him, and we were both given cups by my mother, and we'd put them under the faucet--

[LAUGHTER]

--and drink that warm milk out of that cow. It was really an experience to remember.

I also remember there was a smart aleck kid from Omaha-- that's a big town, you know? I live in a little town. And he says, how does it work? Well, I say, you put hay and water in one end, and there's a kind of a bag on the other with those four things that's sticking down there.

And he says, what are those for? Well, I said, one of them is for milk, the other one's for skim milk, another one's for cream. He says, what's the other one for? I said, that's for chocolate milk.

You can see, even when I was five years old, I was an educator.

Yeah, but you see, my question is, even if this goes off in one millionth of a second, if your shutter speed is not that quick, you're not going to see it anyway.

You don't use a shutter in the camera. You do it in a dark room, and you let all the exposure come from the light.

There you go, I didn't realize that.

You learned something tonight. Congratulations.

[LAUGHTER]

So there's a lot of things I can't do, I just say, push that over. That's for the next generation.

Finally this evening, our person of the week. It is unusual for us to choose someone who just died. We do so this week because, as often happens, only when someone dies does a really large audience of people have come to realize and appreciate how much that person had accomplished. And we are all so much more enlightened because of this man's imagination.

Doc Edgerton, the scientist and teacher, who wanted to be remembered as much for his views on life as much as for the life he enabled us to view.

And so we choose Harold Doc Edgerton, who has died at 86. Tinkerer and visionary, he shed light where there was only shadow. He enlarged the world for scientists, historians, and those of us just with family scrapbooks. He was, most personally, dedicated to those thousands of people who passed through his classroom. I'm just a crazy old professor, he said, crazy like a fox.

[MUSIC PLAYING]