

Thanks to lasers, we can 'hear' Bell's shadow

It happened in bright winter sunshine 100 years ago, and Alexander Graham Bell called it his greatest invention. The telephone, right? Wrong. Bell's pride and joy was the photophone, his method of sending human speech over a beam of light. The photophone is the spiritual ancestor of lightwave communications. Far ahead of its time, Bell's photophone had to wait for the invention of laser, ultra-transparent glass fibers, and much of modern electronics to become practical.

LIGHTWAVE communications helped report events of the Winter Olympics at Lake Placid, N.Y., relaying the sounds, color television pictures, and sports statistics to the world. Heart of a typical lightwave system is a half-inch cable of up to 144 strands of threadlike glass fibers that can convey almost 50,000 separate communications.

The photophone was already a germ in Bell's mind when he talked to members of the Royal Society in London on May 17, 1878, about a newly discovered property of the element selenium.

"If you insert selenium in the telephone battery and throw light upon it, you change its resistance and vary the strength of the current you have sent to the telephone, so that you can hear a shadow."

It was just an idea then, but two years later Bell and co-inventor

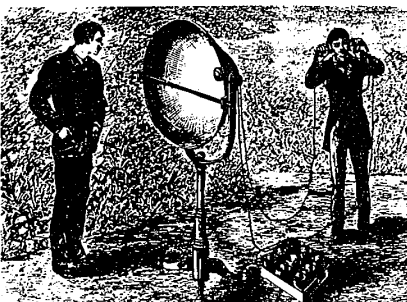
Sumner Tainter, a young instrument maker from Watertown, Mass., had done it.

They took a small mirror thin enough to vibrate to the tones of the voice and mounted it so that it could catch a beam of sunlight.

When words were spoken at the mirror, it vibrated, throwing the reflected sunbeam into vibrations, which were focused on a small cell of selenium

connected to a telephone receiver. When the sunbeam, shimmering in intensity with the voice vibrations, hit the selenium cell, its electrical resistance fluctuated, too, causing the telephone earphones to reproduce the words.

HIS LIPS close to the photophone mouthpiece, Bell would begin with "Hoy! hoy! hoy!", which he insisted was the best way to open calls.



"Hearing the sun sing," Alexander Graham Bell declared his photophone a success. (Drawing from Bell Laboratories)

Bell, Tainter, members of their families and the household and laboratory staff—all had something to say over the photophone, often variations of "Do you hear me?"

Listeners in these first experiments were out of earshot from the speaker, relying only on a telephone receiver in another room.

On March 30, Tainter and Bell tried photophone transmission over a longer distance. They mounted the transmitter in a vacant lot nearly 261 feet away from the receiver, which was in a rear window of the L Street lab.

Bell said it sounded loud and clear, "like a deep-toned organ pipe."

Two days later, April 1, they tried a voice transmission. Remounting the transmitter in the vacant lot, they took aim into the lab's closed window.

Tainter commanded "Halloo, halloo, halloo... come to the window!" and the overjoyed Bell—as he recalled for some Cornell students a few years later—grabbed his hat and "waved with vigor, and with an enthusiasm which comes to a man not often in a lifetime."

With the primitive photophone, only some words and phrases came through clearly. After one test Bell conceded: "It is doubtful whether the words would have been understood had I not expected them."

In all, Tainter and Bell tried more than 50 variations of their equipment. After their most successful experi-

ments, on Feb. 19 and on March 30 and April 1, they packed the equipment in two sealed tin boxes with descriptions of the tests, certified by eyewitnesses.

The equipment from the February experiment is the centerpiece of an exhibit, The 100th Anniversary of the Photophone, at National Geographic Society headquarters in Washington, D.C. The exhibit, put together by Bell Laboratories, headquartered at Murray Hill, N.J., also includes lightwave communications.

A week after the Feb. 19 experiment, Bell wrote to his father:

"I have heard articulate speech produced by sunlight! I have heard a ray of the sun laugh and cough and sing! I have been able to hear a shadow, and I have even perceived by ear the passing of a cloud across the sun's disk."

Then Bell went on, free of the usual caution in his predictions.

"Can imagination picture what the future of this invention is to be? We may talk by light to any visible distance without any conducting wire. In warfare the electric communications of an army could neither be cut nor tapped... The twinkling stars may yet be recognized by characteristic sounds, and storms and sun-spots be detected in the sun."

In 1897 an American Bell Telephone Co. engineer spoke over a distance of several miles with a photophone that used a carbon arc as a light source. But the invention remained impractical for general use.

In 1921, the year before Bell died, he told an interviewer: "In the importance of the principles involved, I regard (the photophone) as the greatest invention I have ever made—greater than the telephone."

State offices open Saturday

Three Michigan Secretary of State branch offices in south Oakland County are among 42 statewide that will be open Saturdays beginning the week of April 14.

New office hours for the Southfield branch, 29203 Southfield Road, and Madison Heights branch, 27645 John R, will be 8:30 a.m. to 5 p.m. Tuesdays

through Saturdays.

The Oak Park-Greenfield branch, 26142 Greenfield, will be open Monday through Saturday from 8:30 a.m. to 5 p.m.

Before an experimental program was started in 12 offices two years ago, all branches were open Monday through Friday.

County health division sponsors diabetic series

A series of diabetic classes, sponsored by the Oakland County Health Division, will begin Monday, April 14 at the county Service Center, 1200 N. Telegraph, in Pontiac.

The six two-hour classes, which start at 7:30 p.m., will be taught by a registered dietitian and a public health nurse. The classes are designed for school-age children and families.

Class topics include the nature of diabetes, dietary management, medications and suggestions for treating everyday problems.

A written statement from the diabetic's physician is required for enrollment and should be presented at the first class session. There is no fee for the classes, but pre-registration is requested. To register, call the Oakland County Health Division, education office, 858-1394.

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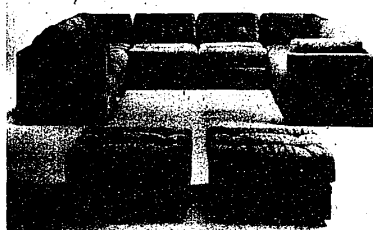
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Have you ever planned a party - and then almost nobody showed up? Well then you know how we feel about business conditions during January, February and March. For the past three months, Barretts has stockpiled inventory of Contemporary and Scandinavian furnishings from the world's best known quality manufacturers.

Not just one's and two's but dozens of the most stylish, beautiful, functional and durable home furnishings pieces in America and from Denmark, Sweden and Norway... then almost nobody showed! (What with run-away inflation, the Iranian crisis, presidential nominations, income tax and the likes, we kind of understand.)

But now we are stuck with all the party favorites... like sofas, love seats, pit groups, chairs, sofas, end and cocktail tables, bookcases, desks, lamps, dining and bedroom items... hundreds and hundreds of all kinds of first quality fashionable merchandise that simply must be sold now!

Look around your room, your whole home, right now, if you see something that needs replacing or there's an undecorated corner or a whole room to be done, here is your chance to do it and save. Barretts lowest prices on quality merchandise now during Friday and Saturday, April 11 & 12th. It's a party you won't want to miss. You'll want to go early... and stay late!



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