

Bell's Golden Vaporware

(excerpt from: "The Hacker Crackdown: Law And Disorder On The Electronic Frontier" by Bruce Sterling, 1992)

Technologies have life cycles, like cities do, like institutions do, like laws and governments do.

The first stage of any technology is the Question Mark, often known as the "Golden Vaporware" stage. At this early point, the technology is only a phantom, a mere gleam in the inventor's eye. One such inventor was a speech teacher and electrical tinkerer named Alexander Graham Bell.

Bell's early inventions, while ingenious, failed to move the world. In 1863, the teenage Bell and his brother Melville made an artificial talking mechanism out of wood, rubber, gutta-percha, and tin. This weird device had a rubber-covered "tongue" made of movable wooden segments, with vibrating rubber "vocal cords," and rubber "lips" and "cheeks." While Melville puffed a bellows into a tin tube, imitating the lungs, young Alec Bell would manipulate the "lips," "teeth," and "tongue," causing the thing to emit high-pitched falsetto gibberish.

Another would-be technical breakthrough was the Bell "phonograph" of 1874, actually made out of a human cadaver's ear. Clamped into place on a tripod, this grisly gadget drew sound-wave images on smoked glass through a thin straw glued to its vibrating earbones.

By 1875, Bell had learned to produce audible sounds - - ugly shrieks and squawks -- by using magnets, diaphragms, and electrical current.

Most "Golden Vaporware" technologies go nowhere.

But the second stage of technology is the Rising Star, or, the "Goofy Prototype," stage. The telephone, Bell's most ambitious gadget yet, reached this stage on March 10, 1876. On that great day, Alexander Graham Bell became the first person to transmit intelligible human speech electrically. As it happened, young Professor Bell, industriously tinkering in his Boston lab, had spattered his trousers with acid. His assistant, Mr. Watson, heard his cry for help -- over Bell's experimental audio-telegraph. This was an event without precedent.

Technologies in their "Goofy Prototype" stage rarely work very well. They're experimental, and therefore half-baked and rather frazzled. The prototype may be attractive and novel, and it does look as if it ought to be good for something-or-other. But nobody, including the inventor, is quite sure what. Inventors, and speculators, and pundits may have very firm ideas about its potential use, but those ideas are often very wrong.

The natural habitat of the Goofy Prototype is in trade shows and in the popular press. Infant technologies need publicity and investment money like a tottering calf need milk. This was very true of Bell's machine. To raise research and

development money, Bell toured with his device as a stage attraction.

Contemporary press reports of the stage debut of the telephone showed pleased astonishment mixed with considerable dread. Bell's stage telephone was a large wooden box with a crude speaker-nozzle, the whole contraption about the size and shape of an overgrown Brownie camera. Its buzzing steel soundplate, pumped up by powerful electromagnets, was loud enough to fill an auditorium. Bell's assistant Mr. Watson, who could manage on the keyboards fairly well, kicked in by playing the organ from distant rooms, and, later, distant cities. This feat was considered marvellous, but very eerie indeed.

Bell's original notion for the telephone, an idea promoted for a couple of years, was that it would become a mass medium. We might recognize Bell's idea today as something close to modern "cable radio." Telephones at a central source would transmit music, Sunday sermons, and important public speeches to a paying network of wired-up subscribers.

At the time, most people thought this notion made good sense. In fact, Bell's idea was workable. In Hungary, this philosophy of the telephone was successfully put into everyday practice. In Budapest, for decades, from 1893 until after World War I, there was a government-run information service called "Telefon Hirmondo." Hirmondo was a centralized source of news and entertainment and culture, including stock reports, plays, concerts, and novels read aloud. At certain hours of the day, the phone would ring, you would plug in a loudspeaker for the use of the family, and Telefon Hirmondo« would be on the air -- or rather, on the phone.

Hirmondo is dead tech today, but Hirmondo might be considered a spiritual ancestor of the modern telephone-accessed computer data services, such as CompuServe, GEnie or Prodigy. The principle behind Hirmondo« is also not too far from computer "bulletin-board systems" or BBS's, which arrived in the late 1970s, spread rapidly across America, and will figure largely in this book.

We are used to using telephones for individual person-to-person speech, because we are used to the Bell system. But this was just one possibility among many. Communication networks are very flexible and protean, especially when their hardware becomes sufficiently advanced. They can be put to all kinds of uses. And they have been -- and they will be.

Bell's telephone was bound for glory, but this was a combination of political decisions, canny infighting in court, inspired industrial leadership, receptive local conditions and outright good luck. Much the same is true of communications systems today.

As Bell and his backers struggled to install their newfangled system in the real world of nineteenth-century New England, they had to fight against skepticism and industrial rivalry. There was already a strong electrical communications network present in America: the telegraph. The head of the Western Union telegraph system dismissed Bell's prototype as "an electrical toy" and refused to buy the rights to Bell's patent. The telephone, it seemed, might be all right as a parlor

entertainment -- but not for serious business.

Telegrams, unlike mere telephones, left a permanent physical record of their messages. Telegrams, unlike telephones, could be answered whenever the recipient had time and convenience. And the telegram had a much longer distance-range than Bell's early telephone. These factors made telegraphy seem a much more sound and businesslike technology -- at least to some.

The telegraph system was huge, and well-entrenched. In 1876, the United States had 214,000 miles of telegraph wire, and 8500 telegraph offices. There were specialized telegraphs for businesses and stock traders, government, police and fire departments. And Bell's "toy" was best known as a stage-magic musical device.

The third stage of technology is known as the "Cash Cow" stage. In the "cash cow" stage, a technology finds its place in the world, and matures, and becomes settled and productive. After a year or so, Alexander Graham Bell and his capitalist backers concluded that eerie music piped from nineteenth-century cyberspace was not the real selling-point of his invention. Instead, the telephone was about speech -- individual, personal speech, the human voice, human conversation and human interaction. The telephone was not to be managed from any centralized broadcast center. It was to be a personal, intimate technology.

When you picked up a telephone, you were not absorbing the cold output of a machine -- you were speaking to another human being. Once people realized this, their instinctive dread of the telephone as an eerie, unnatural device, swiftly vanished. A "telephone call" was not a "call" from a "telephone" itself, but a call from another human being, someone you would generally know and recognize. The real point was not what the machine could do for you (or to you), but what you yourself, a person and citizen, could do *through* the machine. This decision on the part of the young Bell Company was absolutely vital.

The first telephone networks went up around Boston - - mostly among the technically curious and the well-to-do (much the same segment of the American populace that, a hundred years later, would be buying personal computers). Entrenched backers of the telegraph continued to scoff.

But in January 1878, a disaster made the telephone famous. A train crashed in Tarriffville, Connecticut. Forward-looking doctors in the nearby city of Hartford had had Bell's "speaking telephone" installed. An alert local druggist was able to telephone an entire community of local doctors, who rushed to the site to give aid. The disaster, as disasters do, aroused intense press coverage. The phone had proven its usefulness in the real world.

After Tarriffville, the telephone network spread like crabgrass. By 1890 it was all over New England. By '93, out to Chicago. By '97, into Minnesota, Nebraska and Texas. By 1904 it was all over the continent.

The telephone had become a mature technology. Professor Bell (now generally known as "Dr. Bell" despite his lack of a formal degree) became quite wealthy. He

lost interest in the tedious day-to-day business muddle of the booming telephone network, and gratefully returned his attention to creatively hacking-around in his various laboratories, which were now much larger, better-ventilated, and gratifyingly better-equipped. Bell was never to have another great inventive success, though his speculations and prototypes anticipated fiber-optic transmission, manned flight, sonar, hydrofoil ships, tetrahedral construction, and Montessori education. The "decibel," the standard scientific measure of sound intensity, was named after Bell.

Not all Bell's vaporware notions were inspired. He was fascinated by human eugenics. He also spent many years developing a weird personal system of astrophysics in which gravity did not exist.

Bell was a definite eccentric. He was something of a hypochondriac, and throughout his life he habitually stayed up until four A.M., refusing to rise before noon. But Bell had accomplished a great feat; he was an idol of millions and his influence, wealth, and great personal charm, combined with his eccentricity, made him something of a loose cannon on deck. Bell maintained a thriving scientific salon in his winter mansion in Washington, D.C., which gave him considerable backstage influence in governmental and scientific circles. He was a major financial backer of the the magazines *Science* and *National Geographic,* both still flourishing today as important organs of the American scientific establishment.

Bell's companion Thomas Watson, similarly wealthy and similarly odd, became the ardent political disciple of a 19th-century science-fiction writer and would-be social reformer, Edward Bellamy. Watson also trod the boards briefly as a Shakespearian actor.

There would never be another Alexander Graham Bell, but in years to come there would be surprising numbers of people like him. Bell was a prototype of the high-tech entrepreneur. High-tech entrepreneurs will play a very prominent role in this book: not merely as technicians and businessmen, but as pioneers of the technical frontier, who can carry the power and prestige they derive from high-technology into the political and social arena.