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Our industrious roots

Western Electric

'This *was* Silicon Valley'

By Tony Lucia
Reading Eagle

Berks County, PA - Editor's note: The Western Electric-Lucent Technologies-Agere Systems presentation is the ninth in an occasional series on the major industries, the people and the legacies for which Berks County is known.

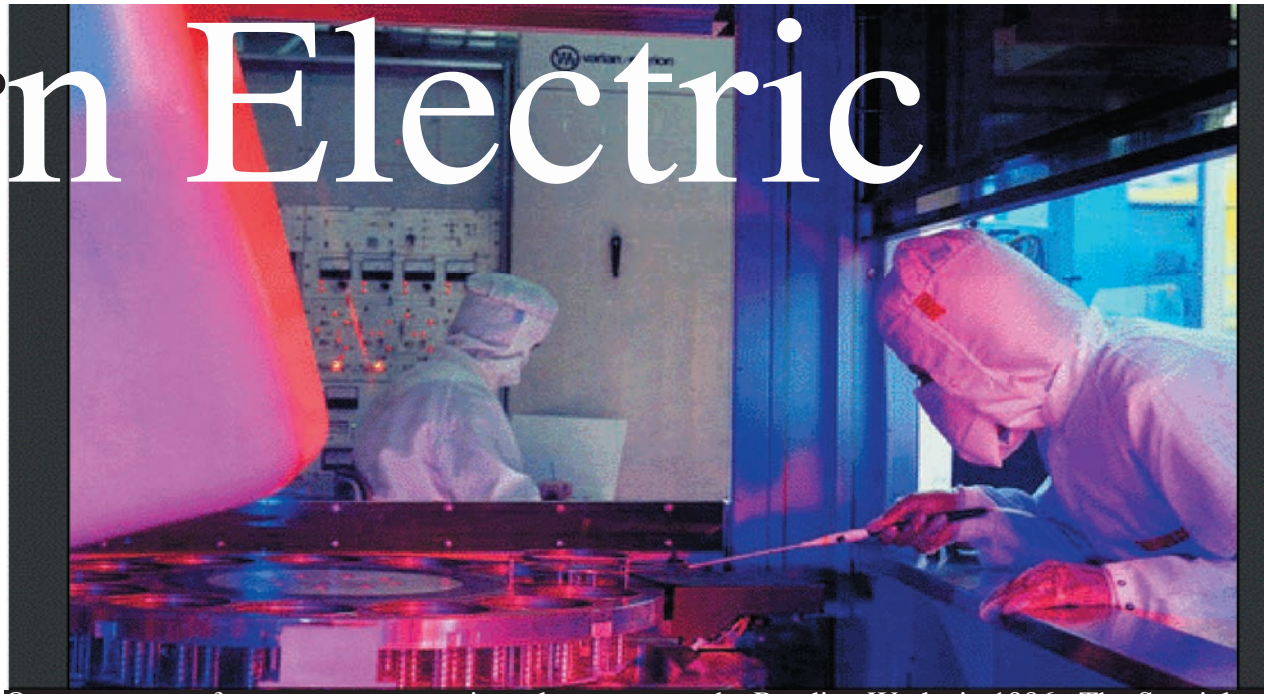
No one remembers exactly how it happened, or who made the first move. But it went something like this.

Western Electric had a plant in Allentown that was involved in the design and making of a new electronic component called the transistor, which the U.S. government increasingly needed for communications, radar systems and early computers.

Western and the government were looking for a site that would manufacture components exclusively for government needs.

It so happened that at the same time, business and government leaders in Berks County were looking for new manufacturing to fill the vacuum left by textile mills which were closing throughout the county and moving southward.

Sidney D. Kline Jr., past chairman of the law firm of Stevens and Lee, said his father, who had been president of Greater Berks Development Fund, and Thomas Cadmus, head of the Reading-Berks Chamber of Commerce, as it then was called, were among the leading figures in the drive to bring new business to Berks County.



Operators manufacture components in a clean room at the Reading Works in 1986. The Special suits and the filtration of air kept dust particles from contaminating the products.
Courtesy of Chuck Russo/Mattlin Photographics.

"Our industrial base was beginning to change," Kline said. "The impetus was to bring industry to Berks County."

The corporation's and the community's needs converged at the Rosedale Knitting Mills, a women's hosiery operation that had been founded in 1914 in a warren of prosaic brick buildings tucked away in a quiet, residential enclave of Laureldale.

Western Electric took a five-year lease on the property and opened its plant there on Aug. 22, 1952. By the end of the year, it employed 130 workers, then doubled that number within a year.

By the end of the decade, Western Electric - along with its successors, the Reading Works of AT&T Technologies, Lucent Technologies and Agere Systems - mushroomed into one of the county's largest, best-paying and most prestigious employers.

Part of that prestige accrued to the 1958 addition of a Bell Laboratories branch at the Laureldale site. Bell Labs, henceforth part of the local operation, was the design arm of AT&T and Western its manufacturing operation.

Western moved in 1962 into a new modern plant on North 11th Street in Muhlenberg Township which was built by Greater Berks Development Fund and purchased by Western two years later. Greater Berks President Edward J. Swoyer Jr. said the plant remains by far

the largest project the fund ever has undertaken. The Laureldale facility closed in the late '60s.

At about the same time it moved into the new plant, Western transitioned away from government contracting and into communications products for the Bell System - products which were made under ever more exacting and specialized conditions.

Many workers, especially in the early days, were drawn from the local textile industries, where the work also required great manual dexterity.

Many of these were women, and Western Electric was foremost among area employers whose work force included a large female component. The organization also fostered a climate of tolerance as an equal-opportunity employer.

Pay was good, both for production workers who in some cases hadn't had the benefit of higher education, and for employees in the more skilled and technical areas, such as Bell Labs, where master's degrees and doctorates were not uncommon.

In some cases, employees acknowledged there could be a disconnect on exactly what the high-tech gizmos they were making would be used for.

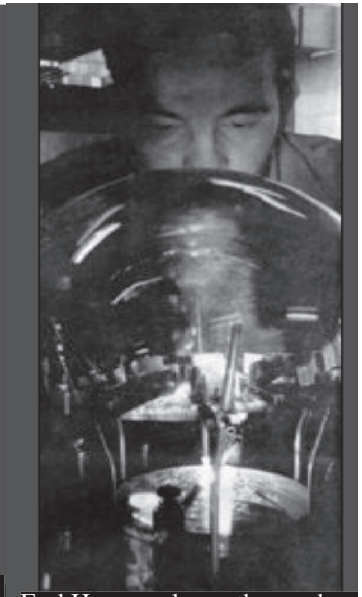
"It's kind of like making a valve stem and conceptualizing a car," explained Karl E. Luckhart of Exeter Township, a 25-year employee who retired as a maintenance technician.

The purity of materials used in production and the avoidance of flaws were maintained throughout production, in some instances involving clean rooms - environments exceeding even hospital standards, in which air was filtered to reduce dust and workers had to wear special outfits.

Utmost caution also was taken with the handling of such toxic ingredients as gallium arsenide.

"One bottle had enough to kill the city of Reading," said Elem E. "Skip" Freeman Jr. of Robeson Township, an 18-year employee who retired as a maintenance technician.

Western Electric employed great numbers of women in jobs that required manual dexterity. As time went on, many also moved in the ranks of management.
Courtesy of Milton Embree.



Earl Haas works on the production of transistors in a vacuum jar at Western Electric in 1957

The Laureldale plant of Western Electric in the former Rosedale plant prior to 1962.
Courtesy of Chuck Russo/Mattlin Photographics

The Muhlenberg Township plant of Lucent Technologies in 1998.
Courtesy of Chuck Russo/ Mattlin Photographics

Something of a self-contained city, the plant had its own fire department and, of course, security, a cafeteria, its own water-treatment system - to supply highly purified water for production requirements. The plant was highly socialized. Events such as picnics and family days were regularly held, and workers further organized events on their own time.

The number of these workers, which waxed and waned according to customer demand, hit a peak of 4,900 in 1984. That, by comparison, is a range in which Berks County's top employers today, Reading Hospital and East Penn Manufacturing Co., only very recently have topped.

With a sad symmetry of sorts, it all ended almost exactly 50 years after it began, with the decommissioning of the Agere plant in May 2002.

There are various opinions on why it closed, often with strong feelings attached to them, but on one thing there is no disagreement: the pride in the work that was done there.

Lewis E. Miller of Wyomissing, who was among the small contingent of Allentown Bell Labs employees who started up the Reading branch, put it most succinctly.

"We were making transistors here before Silicon Valley started," he said. "This was Silicon Valley."

• Contact reporter Tony Lucia at 610-371-5046 or tlucia@readingeagle.com.

What they made

From our news staff

Many of the components and products made at Western Electric and its successor organizations in Muhlenberg Township were state-of-the-art, high-tech items manufactured using highly refined processes. Some were very lucrative; others never quite took off.

Here are just a few:

• **The transistor.** Bell Laboratories scientists William Shockley, John Bardeen and Walter Brattain invented the transistor in 1947, and when the Laureldale Western Electric plant opened in 1952, it was primarily for manufacture of this revolutionary component.

Lewis E. Miller of Wyomissing, who had been employed at the Allentown Bell Labs branch and relocated to the Reading Works in 1958 as part of the initial Bell Labs contingent in Berks County, said silicon and germanium transistors developed at the local plant were the precursors to everything that evolved into the integrated circuit.

Transistors made in Laureldale were aboard the first U.S. satellites.

• **The magnetron.** Sounding like something out of a ’40s-era science-fiction magazine, the magnetron was a vacuum-tube component of radar and sonar systems which generated the powerful pulse signal to be reflected off targets.

It was produced at the Reading Works in the plant’s early years as a government contractor. Today, magnetrons are more commonly used in microwave ovens.

• **Integrated circuits.** Although patented by researchers at other firms, ICs, which combined increasing quantities of transistors, capacitors and other components on a single crystal, or chip, also were developed by Bell Labs scientists and ultimately produced in vast quantities at the Reading Works. Production of linear integrated circuits became an increasingly important line in the 1970s.

• **Lightwave technology.** The Reading plant was in the forefront of fiber-optic devices for telecommunications uses, including laser modules used in high-capacity systems, analog lasers providing higher capacity for cable television and fiber amplifiers used in long-distance networks.

• **PicturePhone.** This futuristic technology was produced in the late 1960s at the Berks plant, but may have been ahead of its time. Cable was required to transmit the images and at that time was not widely available everywhere a phone could go.

“I don’t know how many they made,” said Robert S. Guldin of Shillington, an engineer and later supervisor. “They got shoved in storerooms. It never went anywhere.”

The device was shown at the 1964 World’s Fair, had a role in “2001: A Space Odyssey” and subsequently was offered to the public by AT&T in a few major cities. But the cost of operation and other factors led to its hasty demise. AT&T reportedly took a $1 billion loss on the unit.

• **Plasma screens.** A pilot production line for plasma TV screens was established at the plant until it was determined that due to expense, the project was not sustainable.

“They developed that and made 14 panels successfully, and then abandoned it,” said John Dominicis of Exeter Township, a maintenance technician. “They said it wasn’t a feasible project. They had a lot of things they didn’t go with.”

Sources: Reading Eagle and AT&T archives; davidszondy.com/future/Living/picturephone.

Our industrious roots

Ginny Miller compares a Russian transistor, in her left hand, with a transistor made at Western Electric’s Berks County operations in 1957.
Courtesy of Earl Haas.

John Rupp works on a PicturePhone prototype at the Reading Works. The technology never entered widespread commercial use.
Courtesy of Milton Embree.

Inventing and developing the future:

A Western Electric timeline

From our news staff

1947: Technicians at Bell Telephone Research Laboratories, Murray Hill, N.J., invent and patent the transistor.

Aug. 22, 1952: Western Electric Co. opens manufacturing facility in former Rosedale Knitting Mills building in Laureldale, established at the request of the U.S. Signal Corps to make transistors and diodes exclusively for government use. Western takes a five-year lease with an option to extend it from two to five years.

December 1952: The plant employs 130.

Jan. 12, 1956: A diffused base transistor is unveiled at Laureldale before top military brass at a solid-state diffusion symposium.

Oct. 9, 1956: The plant employs 750.

May 20, 1957: Expanding, Western leases the Karl Lieberknecht Inc. building at Marion and Vine streets in Laureldale near the Rosedale buildings.

1958: Bell Laboratories, the research-and-development division of Western Electric, opens a branch laboratory in the plant. The plant also begins producing the magnetron, a radar-system component.

Feb. 1, 1958: The first U.S. satellite, Explorer I, is launched from Cape Canaveral in Florida. It contains transistors made in the Laureldale plant. They are part of a 13-ounce sending station that transmits technical data such as pressure, temperatures and density of matter, the strength of the Earth's magnetic field and cosmic radiation information.

Feb. 26, 1959: Laureldale-made transistors are used in the Titan intercontinental ballistic missile.

July 28, 1959: Western Electric grows to 2,780 employees and is tied with Carpenter Steel Co. as the county's top employer.

Sept. 16, 1959: It is announced that Greater Berks Development Fund will build and lease a new plant for Western Electric on North 11th Street. Architects are Frederick Muhlenberg and Associates, Carl Eisenhower and Muhlenberg Brothers.

June 14, 1960: The size of the projected plant grows by a third to 290,000 square feet. The Laureldale plant now has 3,100 employees, and the need for 4,000 to 5,000 is projected.

1962: The new plant opens. It has 5 acres of roof; 200 miles of wiring, 6 acres of parking. With the move, Western now transitions away from government contracting and toward products for Bell System use. Components from Laureldale orbit the Earth in the telecommunications satellite Telstar.

Sept. 22, 1963: Microwave device development lab opens in the plant.

1964: Western Electric buys the 11th Street building, now called the Reading Works. It has 2,500 employees.

Jan. 31, 1965: New products include miniature diodes for use in computers, voice and television relay systems, a solid-state preamplifier for use in receiver of Nike X planned array radar and a power-output traveling wave tube for a new radio relay system. Bell Labs is doing work on lasers.

1966: All local operations now are consolidated in the new plant and the Laureldale plant closes.

July 10, 1968: Western buys 39 acres of adjacent land, chiefly for employee parking. It now owns 100 acres.

1969: Camera tubes, display tubes and integrated circuits for Bell Systems' Picturephone are made in Berks. Also, Western Electric celebrates its centennial.

July 9, 1969: Reading Works makes transistors for Bell System's fifth transatlantic telephone cable.

June 25, 1972: Products now include light emitting diodes, or LEDs.

Sept. 22, 1974: Reading Works makes 1 billionth semiconductor device. Types of semiconductors include transistors, diodes and integrated circuits.

Nov. 21, 1974: The U.S. government files suit to force AT&T to end an allegedly illegal monopoly over the nation's telephone and telecommunications industry. Western Electric is AT&T's manufacturing subsidiary and one of the nation's largest corporations in itself.

1975: Building 40, the wastewater-treatment plant, goes online.

1980: Building 10, on the west side of North 13th Street, is leased.

Jan. 9, 1980: Reading Works plans a three-story, 210,000-square-foot addition to house offices, administrative functions and executive offices.

March 11, 1981: Reading Works now employs 3,150 and makes more than 338 million integrated circuits, LEDs and lightwave communications devices

1982: Office addition is completed.

March 10, 1982: Products include the gated diode crosspoint, a high-speed switch for lightwave communications systems; and the gallium arsenide field effect transistor, a high frequency microwave device.

1983: AT&T and the U.S. Department of Justice agree to separate the Bell System operating companies from AT&T's long-distance service, research and production divisions, the latter including Western Electric and Bell Labs.

Feb. 5, 1983: Over several weeks, 8,902 job seekers complete job applications. The plant employs 3,400 workers.

Shirley Beck, former employee of Western Electric.
Courtesy of Shirley Beck.

1984: The Bell System divestiture take place as the antitrust lawsuit filed by the Justice Department is settled. The Muhlenberg Township facility becomes known as the Reading Works of AT&T Technologies Inc. The Bell System's research arm, Bell Labs, and its manufacturing subsidiary, Western Electric, form the centerpiece of AT&T Technologies. During this year, employment at the Berks County facility reaches its peak of about 4,900.

1988: Formerly leased from Falconer Security Printing Co., Building 13, on the east side of North 13th Street, is purchased.

March 1991: Following layoffs over six years that have reduced employment to about 3,500, 1,500 job seekers apply for 100 jobs.

1992: Satellite building is constructed on North 13th Street.

1993: Products now include lightwave components, linear bipolar integrated circuits, high voltage integrated circuits, high speed silicon integrated circuits and gallium arsenide integrated circuits. These are used in telephone switching systems, computers and to send and receive telephone, data and video signals via fiber-optic cables.

Feb. 6, 1996: AT&T Technologies announces it will split into three, and that the local operation will become part of telecommunications-equipment manufacturer Lucent Technologies Inc. The word lucent means shining, or giving off light. Reading Works now employs 2,450, making integrated circuits and optoelectronics equipment.

December 1999: Lucent shares hit a high of nearly $80.

May 2000: Lucent begins shedding parts and streamlining operations in an effort to recapture the affection of Wall Street. Lucent opens its new optoelectronics facility at its 200-acre Breinigsville, Lehigh County, campus.

July 22, 2000: Reading Works is to be part of Lucent's microelectronics spinoff.

Jan. 11, 2001: The microelectronics group of Lucent is now Agere Systems Inc.

March 28, 2001: Agere's initial public offering takes place.

Jan. 23, 2002: Agere announces that it will close its Muhlenberg Township and Breinigsville, Lehigh County, facilities and cut another 300 local jobs. Agere had laid off about 7,000 in the last year. The work force at the Muhlenberg facility had been cut to about 1,500.

May 22, 2002: Agere has ended all manufacturing and is decommissioning the plant. The last 346 manufacturing employees had been laid off days earlier.

June 2002: Agere spinoff occurs.

October 2002: Lucent shares hit low of 55 cents.

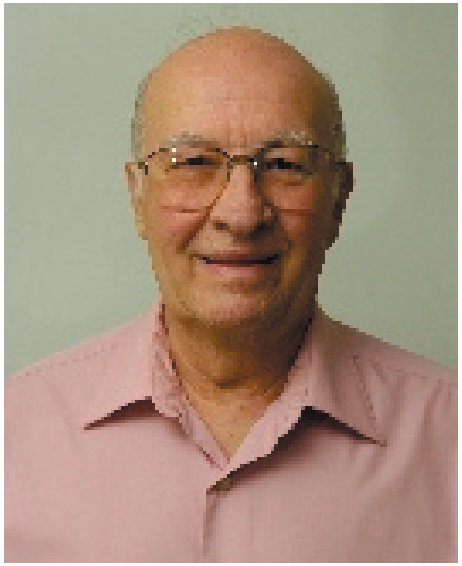
2005: Stonepointe Management Corp., Oaks, Montgomery County, buys the plant. It leases 250,000 square feet to Greater Reading Expo Center.

Source: Reading Eagle archives, www.rhodyman.net

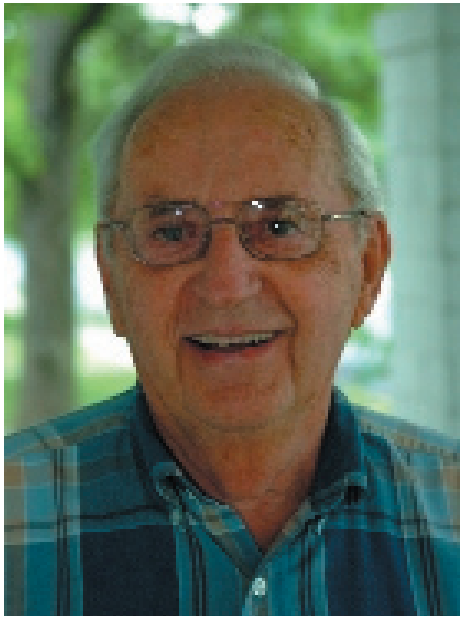
Worker quotes

Reading Eagle

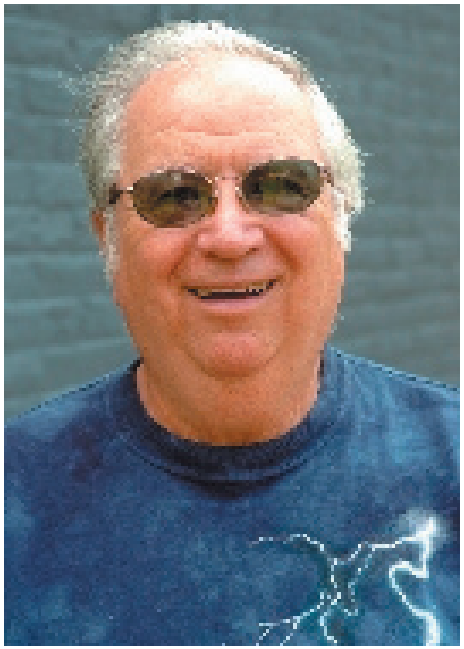
Former Western Electric employees talk about the company.



Earl Haas, Exeter Township, 1955-1993, supervisor and customer-service technician: "I was the guy that made the transistor that went in our first satellite. It was used to transmit data back to Earth. ... They encouraged us to take transistors and diodes home and experiment with them. We made radios and stuff and put them in."



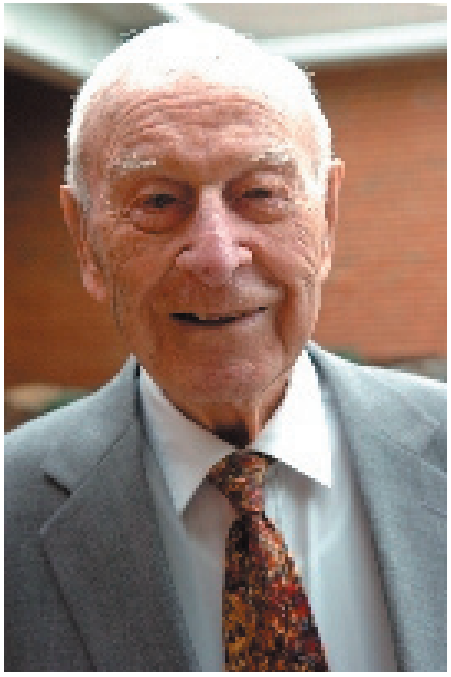
Robert S. Guldin, Shillington, 1955-1987, supervisor: "I was involved with a government project. This was the forerunner of the DEW (Distant Early Warning) Line. We made the receiver portion of that radar system and it was set up out in White Sands, N.M., on the missile range out there. This was developed before the DEW Line was installed across North America, in the Cold War days, to keep an eye on Russia and any missiles that they would have launched."



John Dominicis, Exeter Township, maintenance technician, 1959-1991: "As troubleshooters, we had to change with the equipment. We had to learn new equipment all the time. It stayed in date maybe a year, then it was obsolete. Every day was exciting. You never knew what was going to burn out or blow up."

Milton L. Embree, Wyomissing, Bell Labs, 1958-1995, retired as chief engineer: "We would go to conferences and describe technology in depth and feel very comfortable we were doing something that would improve not only the country but ourselves ... that the whole marketplace would grow."

Lewis E. Miller, Wyomissing, Bell Labs, 1952-1989, engineer and semicon-ductor device development department head: "One thing the military needed was an encryption system that would sit in a two-drawer file cabinet next to their desk, so they could talk and have discussions encrypted. Whippany (New Jersey branch of Bell Labs) took that on. They'd come to me and say, 'Hey, I need miniaturized transistors to meet my space requirements.' These days, that two-drawer file cabinet would fit on one chip."



Everett E. Smith, Wyomissing, 1952-1972, manager of industrial relations and plant services: "It has been thrilling to be in something of that kind (development of the transistor). I'm sure it was more significant to engineers but even to the lay person it was remarkable to see.... Anybody who's been in business knows there's a great difference between the two and to produce something in great numbers and at a reasonable price is a great effort, especially something as new as that."

Like family and more than a paycheck

From our news staff

Berks County, PA -

From its inception in the early ’50s until it closed in 2002, the plant was more than a place to draw a paycheck. For many who worked there, it was like family — in some cases, literally.

“Multiple generations of families worked there,” said Patricia A. Schuster, who worked her way up to managing director, the top position at the plant, and is now general manager of the polychemical division at Brentwood Industries. “You could rarely go somewhere where somebody didn’t work at Western Electric or know someone who worked at Western Electric.

“It was viewed as cradle-to-death employment, with good benefits and higher wages. People had a lot of pride. I think there was a family kind of feeling to that environment.”

So it’s no surprise that at the end, many took it personally.

Karl E. Luckhart of Exeter Township, a 25-year employee who was a maintenance technician, said there were rumors all along that the plant was going to close. When it actually happened, though, it was hard to accept.

“There was always the black cloud hanging over our head,” Luckhart said. “The plant was closing the whole time I was there. Yet we were working overtime.

“When the place shut down, I was 58 years old and didn’t know who was going to hire me. I was kind of devastated, when the reality set in and I was actually done.”

Fortunately, Luckhart quickly landed a new job — indeed, the closing of the plant was something of a field day for area companies in need of highly skilled workers.

Many ex-employees of the firm exude bitterness about the closing, their pensions and the breakup of the old Bell system, which some believe not only laid the groundwork for the successor companies’ problems but also hurt America’s leadership in technological research.

Former managing director of Agere Systems Inc., Patricia A. Schuster, in front of the closed Agere plant.
Photo by Susan L. Angstadt

What can’t be taken away, however, is the comradeship.

Several groups, such as WE-AT&T-Lucent-Agere Toolroom Retirees, get together every month for lunchtime gatherings. And there are online groups, such as the Yahoo Group, Reading Works (http://groups.yahoo.com/group/readingworks), started by Dave Goss. Each has more than 100 members.

“With that organization, people were important,” said Robert S. Guldin, a 32-year employee who retired as a supervisor. “You were not just a number. There were relationships between the people; there was caring. I’m still in touch with the folks out there.”

Schuster, whose husband, Dennis, a senior manager in labor relations, also lost his job when the plant closed, acknowledged the hard feelings left in its wake.

“I think a lot of people were able to move on after a period of time, but there were still a lot of bitter folks,” she said. “Some were caught right on the cusp of their pension. When you have 20 years and you’re short six months, it’s hard to take.

“But the people, the relationships, the friends you made and acquaintances you made through those years, that’s something you treasure.”

Reading Works' 'Indian' giving

From our news staff

Berks County, PA -

Many moons have passed since Chief Red Cloud and his tribe scalped the Reading Works of AT&T and rode off into the sunset.

But they are not forgotten. In fact, just a mention of the word Indians to anyone who worked at the Reading Works of AT&T during that time — other than those directly involved in the scandal — is almost guaranteed to prompt peals of laughter.

The story went something like this:

In early August 1989, a pickup truck with North Carolina plates pulled up to the plant.

Five people claiming to be American Indians, but believed to be gypsies, got out and asked a plant official whether there was any scrap metal they could use for jewelry-making.

To quote a Reading Eagle story from the time:

"They talked such a good game that W. Brad White, plant director, personally escorted them — riding aboard their truck and waving them past security checkpoints — to the scrap area.

"Once there, the con men distracted White and other employees while one of their number directed the loading of hundreds of pounds of recyclable scrap gold, platinum, titanium and circuit components."

It wasn't until the following day that the company realized the deception and that the gypsies had absconded with material valued at somewhere between $30,000 on the low end and as much as $1 million at the upper.

The take included 18 five-gallon drums and a 64-cubic-foot container of scrap metals, as well as two other large containers loaded with various metals and components.

Faces were even redder at the Reading Works when it was discovered that the same ploy unsuccessfully had been tried at several local plants.

Once the story broke, the company quickly clamped down on information about the scam, so it's not known if anyone got the hatchet.

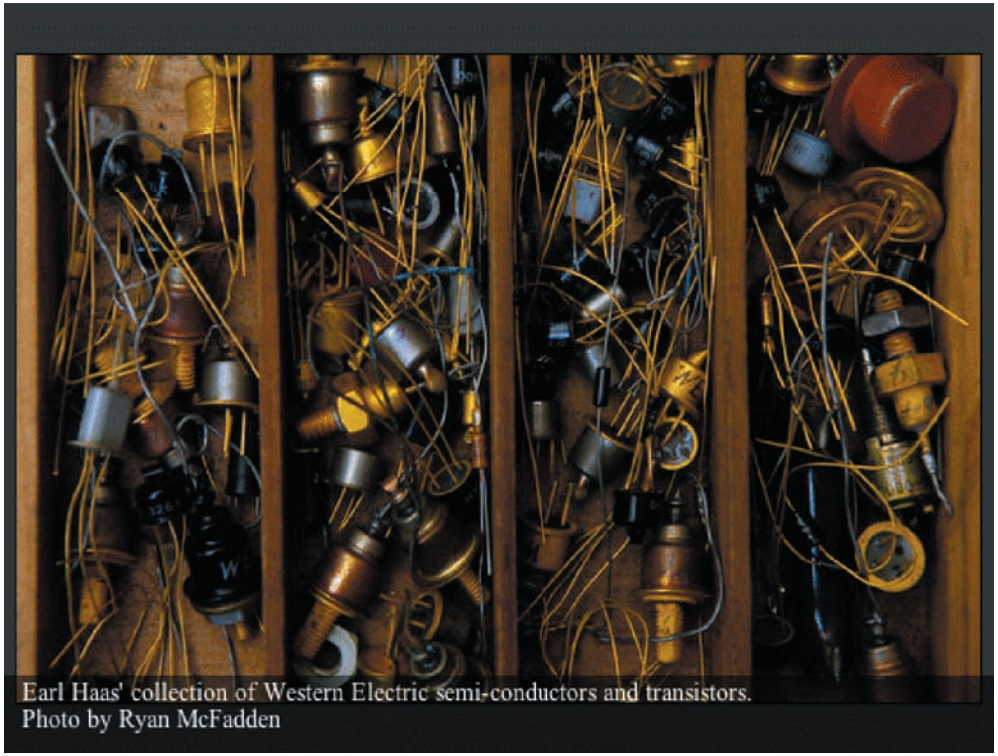
Muhlenberg Township police, meanwhile, corralled some suspects — Chief Red Cloud, a.k.a. Bill Miller, and Little Bear, a.k.a. Bob Miller — but AT&T's three-week delay in responding to police requests for information likely cost law-enforcement officials the opportunity to arrest the pair.

Eventually the posse was called off and Muhlenberg's then-Police Chief Harley N. Smith summed up the case with philosophical detachment.

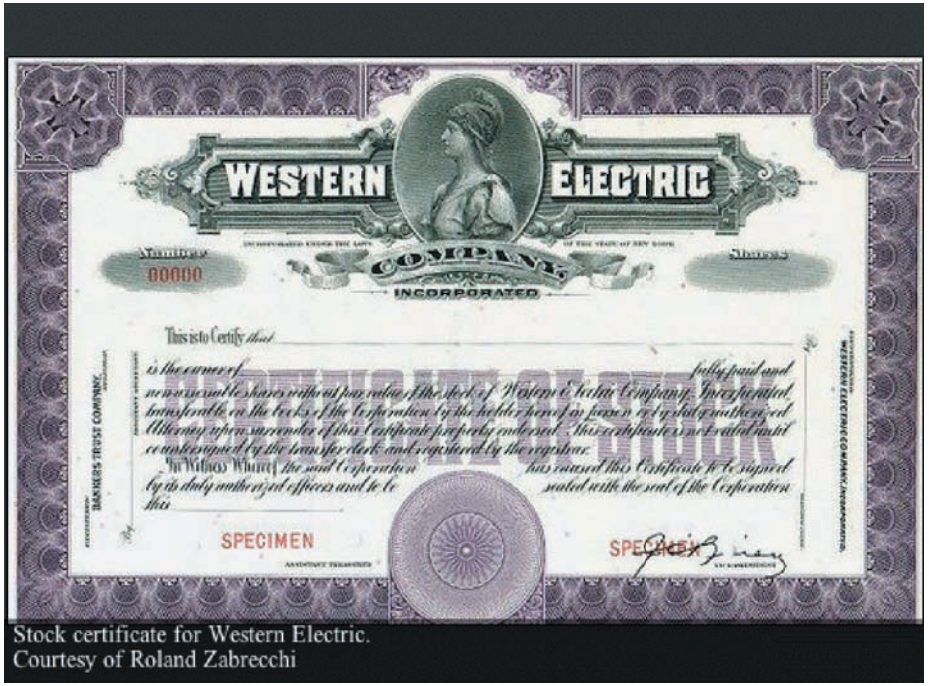
"We usually have gypsy activity in this area every summer," Smith said. "But no one has ever been taken like AT&T was."

Our Industrious Roots

The Western Electric plant in the former Rosedale mill in Laureldale.
Courtesy of Chuck Russo/Mattlin Photographics



Earl Haas' collection of Western Electric semi-conductors and transistors.
Photo by Ryan McFadden

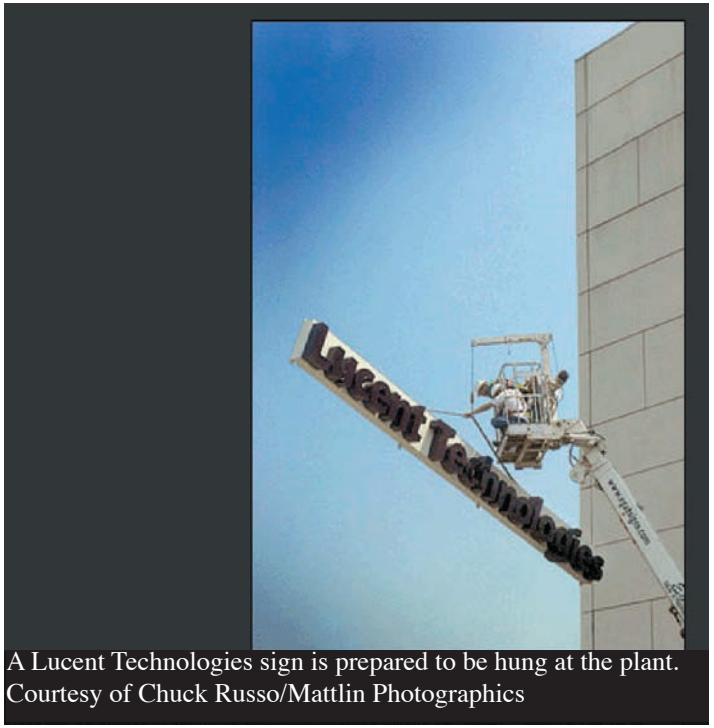


Stock certificate for Western Electric.
Courtesy of Roland Zabrecchi

Earl Haas' collection of Western Electric semi-conductors and transistors.
Photo by Ryan McFadden

Earl Haas' collection of Western Electric semi-conductors given to him by the company.
Photo by Ryan McFadden

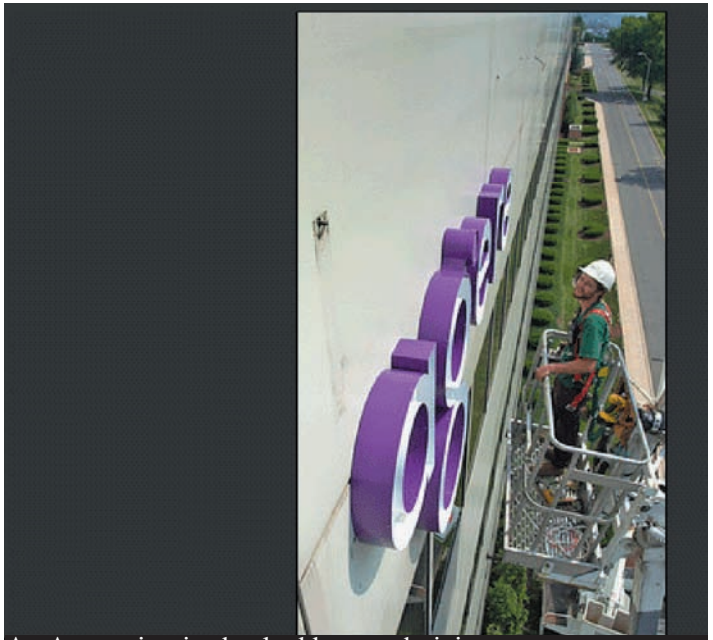
Shirley Beck, former employee of Western Electric, stands in a picket line during a company strike.
Courtesy of Shirley Beck.



A Lucent Technologies sign is prepared to be hung at the plant.
Courtesy of Chuck Russo/Mattlin Photographics

Bell System Logo

An old logo of Western Electric.



An Agere sign is checked by a technician.
Courtesy of Chuck Russo/Mattlin Photographics