

## **Alcoa's 120 Years**

### **Inventing the Process: Charles Martin Hall**

- Charles Martin Hall's discovery came on February 23, 1886 when he was only 22 years old. The globules from this discovery are referred to as Alcoa's "crown jewels."
- The patent application was filed on July 9, 1886 but not actually issued until April 2, 1889.

### **Financing the Business**

- Hall had difficulty finding financial backing to commercialize his process.
- Hall sought assistance from Cowles Electric Smelting & Aluminum Company, which made alloys. Hall worked on the process for them for 90 days. They weren't interested, so Hall was back where he started. However, at Cowles, he met Romaine C. Cole, who recognized the value of Hall's invention and recommended contacting Capt. Alfred E. Hunt—one of the foremost metallurgists in the steel industry.
- Hunt was so impressed with Hall's process that he called a preliminary meeting of five of his associates (all under age 35) on July 31, 1888. Although the first name selected for the business was Pittsburgh Aluminium Company, the enterprise was incorporated as The Pittsburgh Reduction Company on October 1, 1888.
- On August 8, 1888, they agreed to put up \$20,000, \$5,000 at a time, to build a pilot plant.

### **Our First Employee: Arthur Vining Davis**

- Alcoa's first employee, Arthur Vining Davis came to Pittsburgh in 1888 from Amherst College at the age of 21. His father asked Capt. Hunt for help in finding his son a job. Hunt hired Davis at his Pittsburgh Testing Laboratory, but soon decided that Davis would be a perfect team with Hall.
- In the beginning, Davis and Hall were each taking 12-hour shifts and soon the plant was making between 30 to 50 pounds of aluminum per day at \$8.00 a pound.

### **Alcoa's Strategy: Growing the Business**

- As the business progressed, Hall did research and Davis moved into the leadership role.
- The Pittsburgh Reduction Company was busy trying to perfect its process and find a market for aluminum before its patent protections expired. For example, in 1890, Davis borrowed molds from the Griswold Company of Erie, PA, a manufacturer of cast iron cookware, and had some aluminum teakettles made. Griswold was impressed and placed an order for 2,000 kettles. Griswold wanted the kettles, not the aluminum, so Alcoa went into the fabricating business to prove that there was a market for this metal.
- Soon the pilot plant was inadequate. The company sought additional backers, including the Mellons, and returned most earnings to the company during the first decade.
- This additional investment allowed the company to move operations to New Kensington, PA (30 miles outside of Pittsburgh) in 1891. The first metal was produced there in November 1891. Their strategy was vertical integration. After establishing their core smelting business, the company expanded downstream into fabrication, and upstream into the extraction and manufacture of raw materials and power generation. In August 1895, they started producing metal at the new Niagara Works plant in New York.
- Hall and his backers wanted to make aluminum a common metal. To do this, they would have to promote the use of aluminum as a substitute for more familiar commodities. The best way to compete with steel and wood was to lower the price of their product by refining their process and expanding production capacity. Between 1888 and 1897, they were able to reduce the price from \$8.00 a pound to 36 cents a pound.

### **Patent Problems**

- **Heroult** – Shortly after Hall filed his patent application, he learned that Paul Heroult from France had filed a similar application. Although Heroult's invention pre-dated Hall's, his application did not provide a "Preliminary Statement," as had Hall's. Under US patent law, this limited Heroult to the date on his application – May 22, 1886. Hall prevailed because his sister's records proved that his date of invention was February 23, 1886.
- **Cowles and PRC** – Patent disputes arose between the Cowles brothers and Hall. Cowles had started using Hall's process without licensing, and had acquired rights to the Bradley patents for the electric arc process they employed. After suits and countersuits, Cowles and Hall settled by Pittsburgh Reduction Company

licensing the Bradley patents through 1909, and Cowles agreeing to purchase 146,000 pounds of aluminum annually at ten cents off the list price.

### **Antitrust Problems**

- The Sherman Act became law on July 2, 1890, two years after The Pittsburgh Reduction Company began. The law makes restraints of trade illegal and declares that every person who monopolizes trade or commerce among the several states or with foreign countries shall be guilty of a misdemeanor.
- By 1912, the Justice Department believed that Alcoa had violated the Sherman Act on three counts: making restrictive covenants, engaging in alleged acts of unfair competition and participating in foreign cartels. During the next five years, Alcoa held a monopoly on North American aluminum production and produced more than 63% of the total world output.

### **Leadership Changes**

- By WWI, the Mellons controlled as much as one-third of the company stock, but they left management to others. A.V. Davis was considered too young when Hunt died in 1899, so Richard B. Mellon became President. Davis was the General Manager of operations.
- In 1907, the company was renamed Aluminum Company of America, and A.V. Davis was named President in 1910.
- In 1914, Hall died, and his will granted A.V. Davis his stock and the voting rights to additional stock. Davis became Chairman and moved to New York City. Roy Arthur Hunt, Captain Hunt's son, was the operating manager and day-to-day administrative manager in Pittsburgh. Davis' brother, Edward, was in Pittsburgh and worked on developing Alcoa's sales force. Leadership traveled between New York and Pittsburgh.

### **World War I**

- By the time the US entered the war, 90% of Alcoa's production was used in military applications. By 1918, the New Kensington works was producing mess kits, canteens and helmets, instead of cooking utensils. Aluminum became regulated like other strategic materials and prices remained low.
- As the war ended, Alcoa found itself with excess capacity, a huge decline in demand, and a return of imports. Price controls were lifted and the expansion of aluminum spilled over into civilian uses.

### **What Alcoa Learned**

- Prior to the war, Alcoa concentrated on production. The war brought the realization that product improvements would be necessary. Germany had developed Duralumin, a copper, aluminum, magnesium alloy with extraordinary strength and Alcoa had nothing like it. Alcoa's research facilities were practically non-existent. With pressure from the government, Alcoa developed its 17S alloy, a Duralumin substitute.
- Alcoa knew it would have to invest more in research. Francis C. Frary – a brilliant scientist who had achievements in chemistry, chemical engineering and metallurgy – was hired, and started in December 1918. He was responsible for improving the Hall Process from 97.75% pure aluminum to 99.99% pure. In 1930, the state-of-the-art Aluminum Research Laboratory was built in New Kensington. Research continued to be decentralized and Frary's organization became known as the Laboratories.

### **Expanding Outside the U.S.**

- After World War I, as power resources in the US became increasingly expensive, Alcoa expanded. Alcoa entered the bidding for developments in Canada by James B. Duke. By 1925, a deal was struck giving Duke \$16 million in preferred stock and 15% of the common stock. Upon Duke's death three months later, Alcoa purchased a controlling interest in the Canadian venture to help the Duke executors pay the estates taxes.
- By 1928, Alcoa had over half of the world capacity in primary aluminum: 90,000 metric tons in the US, 45,000 in Canada and 15,000 in Europe, but managing overseas operations presented problems. On June 4, 1928, Alcoa divested its ownership/interest in 34 companies worldwide and transferred them to Aluminium Limited of Canada.
- Davis' brother, Edward went to Canada with a few technical experts and salesmen to be President of Aluminium Limited, and Roy Hunt became President of Alcoa.

### **Alcoa Antitrust Case**

- By 1924, the FTC had issued a report criticizing Alcoa's practices. Further complaints were filed and investigations were undertaken, leading up to the 1937 antitrust case against Alcoa.
- The FTC believed Alcoa tried to monopolize bauxite, attempted to monopolize the water power of the world, dominated and controlled the foreign market for aluminum in the US, and engaged in injurious price cutting.
- Alcoa won the trial on all 130 counts. But the Government won the appeal. Review by the Supreme Court was impossible, since four of the justices had been involved in prior antitrust suits against Alcoa. A special act of Congress was necessary to give the 2nd Circuit Court of Appeals the weight of a Supreme Court opinion in this matter. The court found Alcoa controlled over 90% of the US market for aluminum ingot. This proportion alone was sufficient to support a violation of the Sherman Act, regardless of intent to monopolize.
- The Alcoa case is still one of the longest trials to date. The company came close to being dissolved, and may have been, if not for gratitude for the role Alcoa played in winning World War II.

### **World War II**

- World War II began during the antitrust proceedings. While Alcoa was fighting in the courts, the company's aluminum became the strategic material critical to winning the war. Aluminum was so important, that in 1942, eight German saboteurs landed from U-boats; four on Long Island and four just south of Jacksonville, FL on a mission to destroy Alcoa's plants in Alcoa, TN, Massena and East St. Louis.
- As early as 1939, R. S. Reynolds (President of Reynolds Metals) traveled to Europe and saw the German military buildup. When he returned to the US, Reynolds urged Davis to triple capacity for aluminum production for aircraft, but Alcoa was slow to move.
- The government believed that the shortage was due to Alcoa having a monopoly in US primary aluminum production. Alcoa received negative publicity for failing to anticipate war production needs. Alcoa's monopoly was cited as the principal reason.
- With astounding speed, Alcoa met the war time challenge. In three years, Alcoa built over 20 plants: 8 smelters, 11 fabricating plants, 4 refineries, and operated them for the government. Total investments in the industry during World War II rose to \$672 million, of which \$474 million were Alcoa investments. Employment rose from 26,179 in 1939 to 95,044 by 1944.
- After the war was over, the US canceled Alcoa's plant leases and most plants were sold to Kaiser and Reynolds, at or below the cost to build them and Alcoa was required to license the technology necessary to run them. The only plant Alcoa was permitted to keep was the Cressona extrusion plant.
- The country was left with an oligopoly of four major companies – Alcoa, Aluminium Limited, which was to become Alcan, Reynolds and Kaiser. In 1947, Alcoa petitioned for a ruling that it no longer monopolizes the market, but the ruling was rejected and the Justice Department retained jurisdiction over Alcoa until 1957.

### **Family to Institutional Ownership**

- In 1949 George Clapp, one of the original founders of the Pittsburgh Reduction Company, died and was replaced on the Board by Alfred M. Hunt, Captain Hunt's grandson. In 1950, the court ordered Alcoa's major shareholders to divest either Alcoa or Aluminum Limited (Alcan) holdings. Only E. K. Davis sold his Alcoa shares. The court retained jurisdiction over Alcoa to assure that Reynolds and Kaiser do not become weak, ineffective competitors.
- In 1951 Roy Hunt retired as President and Irving W. (known as Chief) Wilson became the first President from a non-founding family.
- Alcoa had been listed on the Curb exchange in 1925, the forerunner of the American Stock Exchange, but on June 11, 1951, Alcoa moved to the "Big Board." Alcoa ventured into television advertising in 1951 by sponsoring Edward R. Murrow's "See It Now" CBS news program.
- In 1952, the Alcoa Foundation was created with the mission to actively invest in the quality of life in Alcoa communities worldwide, and that same year, the Alcoa Building in downtown Pittsburgh was completed as a showcase of aluminum architectural applications.
- In August 1957, A.V. Davis retired after 69 years of service.

### **Aluminum Competition: Out of the Antitrust Shadow**

- Not long after the end of Alcoa's monopoly, there was competition: Anaconda in 1955, Ormet in 1956 and Harvey in 1958. These newcomers established smelters in the US. Alcoa's loss of market share was more than offset by increased demand for products.
- Roy Hunt had been averse to overseas expansion since the 1920s. Alcoa passed up overseas opportunities until Lawrence Litchfield, head of bauxite operations, contracted to enter a French/Swiss/Canadian consortium to mine in Guinea in 1957 without Hunt's knowledge. Hunt was furious, but his active opposition waned. The 1958 Brokopondo venture in Suriname for construction of a hydroelectric plant and smelter was Alcoa's first major offshore mine-to-metal venture.

### **Alcoa in the 1960s**

- After success with Brokopondo, Alcoa was eager to participate in offshore ventures, and in 1961, formed Alcoa of Australia with Western Mining to develop Australia's huge bauxite reserves. In the mid-1960s, Alcoa began developing aluminum operations in Brazil.
- Alcoa moved into the real estate development business starting with Century City in Los Angeles. According to Tod Hunt Jr., at one point, Alcoa was the second largest real estate developer in the U.S.
- Frederick J. "Fritz" Close (Chairman 1966-1970) was Alcoa's most notable salesman. Close was a champion of research and development and led the company during its venture into commercial real estate construction. He carried an enthusiastic spirit for the development of new initiatives, and it was John Harper who drove the strategy.
- John D. Harper (President 1963-65; President and CEO 1965-70; Chairman and CEO 1970-75) joined Alcoa full time in 1933. Under his command, Alcoa moved deeper into fabricated products. Harper had a talent for politics. Krome George said of Harper, "drop him in the middle of the Sahara Desert, and he'd know the guy that ran the nearest oasis in ten minutes."
- In 1961, Alcoa entered the market for aluminum ends for beverage cans first in juice cans. Alcoa developed the Easy-Open aluminum technology and convinced the Pittsburgh Brewing Company to use it in 1962 for their Iron City Beer, followed by the Schlitz and Busch brewing companies. By the end of 1963, the aluminum top had been adopted by most brewers and was on 40% of all US beer cans. By 1968, aluminum ends were more than 80% of the canned beer market. (Today, nearly 100% is aluminum.)
- Close was the force behind the rigid container sheet (RCS) -- Alcoa and the industry's most important new product of the post-war era, but Harper was the one that committed Alcoa to the RCS market in advance of the industry.
- In 1965, the first "outside" director was added to the board, Paul Miller of First Boston Corp.
- The Black Executive Exchange Program was started in 1968, which featured black industrial personnel lecturing at predominately black colleges to bring skills and experience of black professionals to campus.

### **Alcoa in the 1970s**

- The 1970s brought further overseas expansion. By early in the decade, Alcoa established fabricating plants in Colombia, El Salvador, France, The Netherlands, West Germany, Morocco, Tunisia and Libya.
- Additional outside directors and increasing ownership by institutional investors brought additional pressures to maximize profits. Energy costs surged due to the oil shortage and embargo. Power costs at Alcoa's seven domestic smelters increased 400% during this decade. Additional competition from non-aluminum materials rose during this decade as well.
- Alcoa broadened its diversity, including creating the Aid to Minority Enterprises committee "to seek out possible suppliers from potential and existing minority enterprises;" the Alcoa Foundation supported Minority Engineering Programs, and in 1977, Franklin Thomas became the first African American appointed to the Board of Directors.
- In 1978, primary aluminum began trading on the London Metal Exchange.
- W.H. Krome George (President 1970-72; President and COO 1972-75; Chairman and CEO 1975-1983) invested in modernization and introduced computer information systems into smelting and rolling operations

and used mathematic modeling to control production and cut costs. Under George's leadership, Alcoa's foreign investments surged in Brazil and Australia and the Business Unit concept emerged.

### **Alcoa in the 1980s and 1990s**

- While Krome George argued that aluminum still had untapped high-technology potential, Charlie Parry (President 1981-83; Chairman and Chief Executive Officer 1983-87) expanded away from aluminum and diversified into non-aluminum products. Alcoa moved into products where our technical know-how with aluminum-related materials was thought to give us an advantage.
- In 1987, Paul O'Neill was selected as Chairman, the first to come from outside Alcoa. Krome George, who had met Paul O'Neill while on International Paper's board, was instrumental in O'Neill's rise to become Chairman of Alcoa.
- O'Neill reined in product diversification and re-focused on Alcoa's core aluminum businesses. Safety became a primary concern and profit sharing for employees and stockholders was instituted, both of which boosted internal morale and favorable market reaction.
- O'Neill favored a decentralized Business Unit structure, and completely turned the traditional corporate structure pyramid on its head. Alcoa was focused on the customer. The reverse pyramid model emphasized the importance of customer satisfaction as the way to profitability.
- The collapse of the Soviet Union plunged aluminum prices as Russia flooded the market with aluminum in a desperate move to raise cash. In addition, the economic downturn of the early 1990s necessitated layoffs and other cost-cutting measures at Alcoa.
- By the mid-1990s, O'Neill's strategy was paying off and revenues were rising again. Information systems were upgraded and plans began for a new, state-of-the-art corporate office on Pittsburgh's north shore. The company created its first Diversity Steering Committee, and in 1997, Ernie Edwards was named the first African American Senior Vice President and Controller.
- Alain J. P. Belda succeeded O'Neill as CEO in 1999, the year the company was officially renamed Alcoa Inc. to represent our global focus.

### **Alcoa 2000 through today**

- As President under Chairman O'Neill, Alain Belda championed the Alcoa Business System as the method that fulfills the promises of the quality campaigns of the 1980s and '90s. Alcoa made strategic acquisitions, including Alumax, Reynolds and Howmet businesses.
- In 2001, Paul O'Neil left Alcoa and became Secretary of the Treasury. Belda became chairman and chief executive officer.
- In 2002, the Alcoa Women's Network (AWN) was established, and in 2003, the African Heritage Network (AHHN) established.
- As Chairman and CEO, Belda continued the direction O'Neill began with expansion through acquisition, careful cost management and realigning businesses to focus on Alcoa's most important markets: aerospace, ground transportation and defense.
- The events of 9/11, rising fuel costs, increasing instability within the metal markets, and the global economic downturn sent Alcoa on a roller coaster ride in the first years of the new millennium. After an initial drop, aircraft orders gradually rose again in the years after 2001, but global increases in energy costs brought another round of slowing in all transportation markets.
- In 2006, Alcoa hired its Director of Workforce Diversity, and in 2007, the Employees at Alcoa for Gay Lesbian Equality (EAGLE) group was established.
- Klaus Kleinfeld became president and chief executive officer in May 2008.