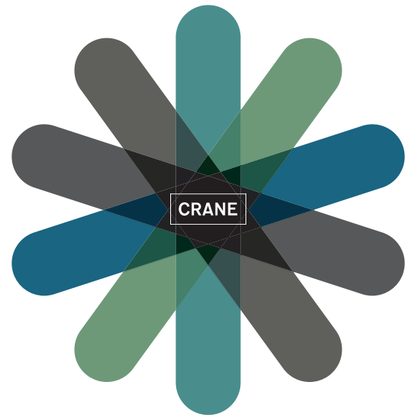
1855



2005

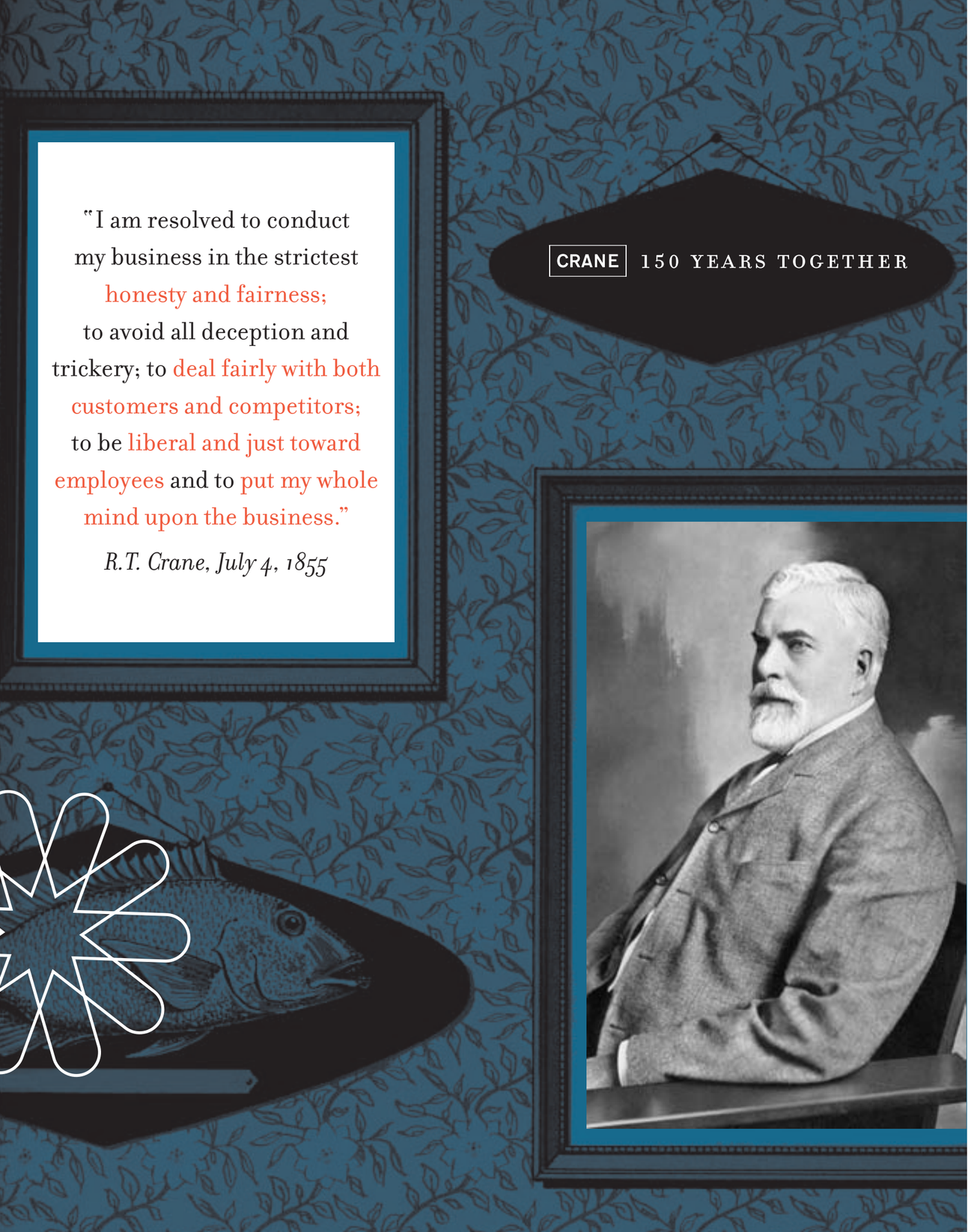
World's largest shower, a highlight of the Chicago World's Fair exhibit, 1933–1934

CRANE 150 YEARS TOGETHER

CRANE 150 YEARS TOGETHER

Crane Co. logo from Power Plant Catalogue No. 1, 1906

VIDEO Crane: 150 Years Together



INTRODUCTION

In this, our 150th year in business, we are celebrating the shared values, shared pride, and shared experiences on which we are building A Better Crane Co. For as long as there has been a Crane company, there has been an unwavering commitment to the words and ideals of Richard Teller Crane.

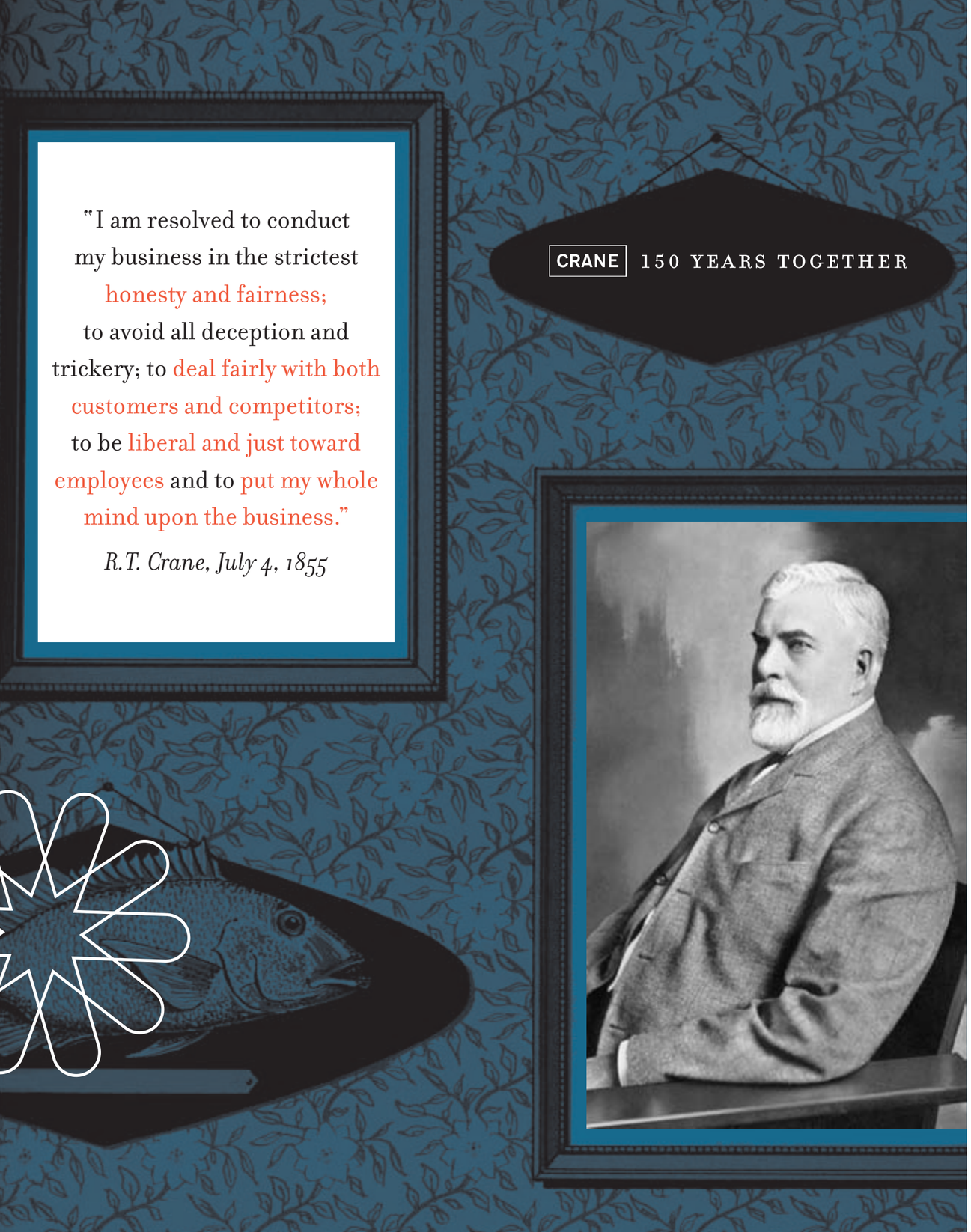
That commitment—which set the standards for a small company whose landmark innovations helped to drive the American Industrial Revolution—has guided our actions and investments for 150 years. The values R.T. Crane expressed are even more relevant today. They continue to guide us as a global, strategically linked, integrated operating company of core businesses that are working together with shared values and shared tools to achieve profitable growth.

I deeply appreciate the dedication and hard work of our employees, the guidance and encouragement of our Board of Directors, and the support of our shareholders. This book is dedicated to past, present, and future members of our great Crane Co. family.

Sincerely,

Eric C. Fast

Eric C. Fast
President and Chief Executive Officer
JULY 4, 2005



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RICHARD TELLER CRANE, PAINTED IN 1904 BY ANDREAS ZORN.

Every great institution is the lengthened shadow of a single man.
His character determines the character of the organization.

RALPH WALDO EMERSON

CHAPTER ONE

A Very Substantial Start

RICHARD TELLER CRANE established a brass and bell foundry in Chicago 150 years ago on such basic principles as honesty and integrity, customer service, and superior craftsmanship. From the beginning, he pledged to conduct his business "in the strictest honesty and fairness; to avoid all deception and trickery; to deal fairly with both customers and competitors; to be liberal and just toward employees and to put my whole mind upon the business." A former child laborer who never forgot his early struggles, R.T. Crane always placed the comfort, health, and safety of his workers foremost in his mind, and for that he earned their respect and admiration. Since July 4, 1855, these basic principles have formed the bedrock of the Crane company culture and have helped guide the organization through times of peace and prosperity as well as through war, social unrest, and economic calamity.

CANAL

FULTON

GO WEST, YOUNG MAN

Born in Paterson, New Jersey, near the Passaic Falls on May 15, 1832, Richard Teller Crane had a short childhood indeed. With the death of his father when he was only nine years old, Crane was put to work in a cotton mill, where he toiled twelve hours a day to help support his family. He then worked in a tobacco plant, on a local farm, and as an apprentice to Mr. John Benson of Brooklyn, New York, in the brass and bell foundry trade. Always anxious to learn new skills, he then became a machinist with Hoe & Company in New York City, one of the leading printing-press manufacturers in the nation. But when the Panic of 1854 hit New York, Crane lost his job and found it impossible to find work in the area. Opportunity beckoned in the West, and young R.T. Crane felt the magnetic pull of Chicago, where his uncle Martin Ryerson ran a successful lumber mill.

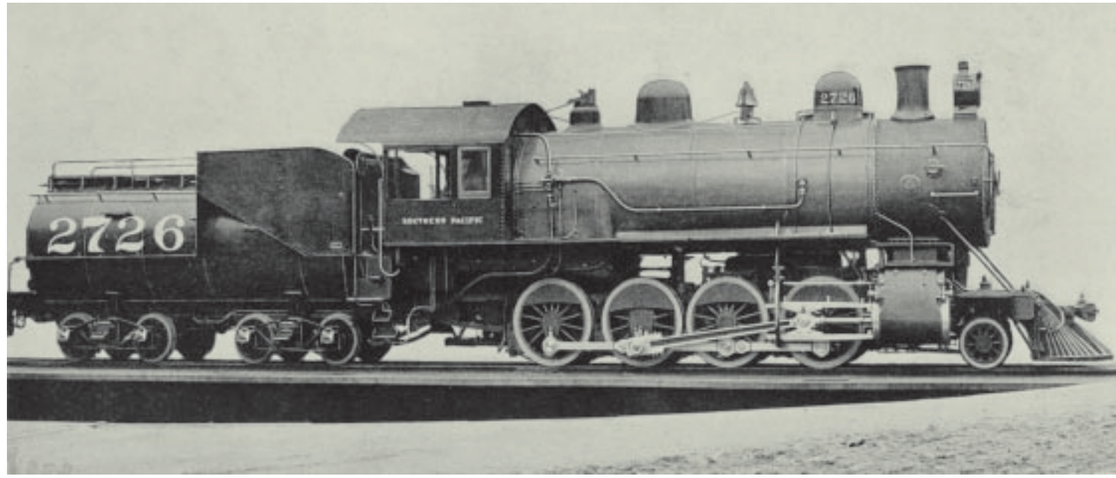
America was electric with excitement and anticipation at the middle of the nineteenth century. Westward expansion and the great urban migration were fueled by a booming transportation revolution. Work had begun on the transcontinental railroad in 1854, and it was easy to foresee that Chicago would soon link East and West through a vast network of rails crisscrossing America. The nation's first oil refinery was constructed in Pittsburgh in 1855, Charles Page had designed an electric locomotive, Isaac Singer had patented the continuous-stitch sewing machine, and new agricultural machinery gave a substantial leg up to midwestern farmers. The nation was transforming from an individualistic, agrarian society into a highly industrialized, integrated social order. America was on the verge of greatness.

Determined to be at the forefront of that transformation, Richard Teller Crane set his sights on Chicago, a city of "magnificent intentions," as one English visitor observed in 1846. Crane arrived in Chicago in the spring of 1855, and found, to his dismay, "one of the most forlorn looking places" imaginable. The city "was literally alive" with rats, Crane recorded in his autobiography, and the unpaved streets "were like a sea of mud." Even into his old age, he wore high boots with his trousers tucked in, a relic of his early days in Chicago. With a population of about seventy-five thousand, only one railroad line entered the city from the east; most commerce was still conducted through the north-south axis along the mighty Mississippi River. Business in the Windy City consisted mainly of lumber, grain, and the packing of hogs. Located at the heart of the burgeoning meatpacking industry, "the driving of hogs and cattle through the city was a common sight for many years," said Crane.

In that raw and unbridled energy of early Chicago, Crane saw that powerful new forces were at work on the city. He launched his one-man business in a corner of his uncle's lumberyard at the southwest corner of Canal and Fulton Streets on Independence Day of 1855, building the fourteen- by twenty-four-foot wooden structure himself. He acquired the sand for molding on the premises, obtained patterns and brass for the couplings, and copper for the lightning rod tips he planned to cast. "Very anxious to see how the furnace and sand would work," he fired it up for the first time on July 4th while the rest of the nation was celebrating the birth of the Republic. "The result was entirely satisfactory," said Crane, "the furnace proving a success and the sand working fairly well, at which I was greatly delighted." His first orders came from Mr. Henry Warrington "for castings of boxes and various other articles used by him in the building of engines" for locomotives, which were driving the Industrial Revolution.

OPPORTUNITY KNOCKS

Crane had only been in business a month when he received his first big break. A representative of P.W. Gates & Co., a large manufacturer of freight cars, engines, and saw mills, brought some patterns of "car-boxes" for him to see. They asked whether he could make these metal containers that held the lubricating material to lessen axle friction on railroad cars. Due to the scarcity of copper in Chicago, Gates's regular supplier was unable to fill these orders, and Crane jumped at the opportunity. He traveled to Detroit, where he "happened to know of a copper smelter," and from him secured a cask of copper. He delivered his fine castings on schedule. A satisfied customer, P.W. Gates & Co. subsequently awarded all of its orders for car-boxes to the up-and-coming R.T. Crane Brass & Bell Foundry. "This circumstance," said Crane, "turned out to be of the greatest importance to me as it enabled me to accommodate Gates & Co. by executing their orders promptly, which they thoroughly appreciated." A key to Crane's success from the very beginning, this unwavering commitment to customer satisfaction had given him "a very substantial start in business."



Richard Teller Crane made engine trimmings and car or "journal" boxes, jobbed chiefly through Gates & Co., for engines and cars such as this Vanderbilt Cylindrical Locomotive Tender.

With every indication that his business was destined to be a success, Crane sent for his brother Charles (left), an iron molder in Paterson, New Jersey, to come to Chicago and help him with the fledgling operation. Charles arrived in the fall of 1855, and R.T. Crane & Brother (as the shop was renamed the following year) made a decision to expand their product line beyond the making of brass castings to include the making and finishing of brass goods. This required additional manpower, so Crane sent for two "first-class workmen" whom he had known in Brooklyn. He placed one of those men, Henry Jones, in charge of the new brass finishing shop. "It was largely through his superior mechanical ability," said Crane, "that we were enabled to promptly bring this portion of our business into first-class shape." With his focus on satisfying his customers and hiring topflight workers, it is hardly surprising that Crane "found no difficulty in obtaining orders as fast as we could execute them."

R.T. Crane & Brother quickly outgrew their small foundry and obtained larger facilities "with power" on the north side of Chicago, facing the river. This location proved to be still too small for the fast-growing enterprise, so the two brothers purchased a lot on West Lake Street, where they built a three-story frame building, twenty feet by forty feet, powered it with a six-horsepower engine, and put a brass foundry in the back. Before long, they outgrew the demand for their goods in Chicago, so R.T. Crane traveled to many of the growing towns in the region that could supply him with orders for brass engine trimmings, including Milwaukee, Wisconsin; Louisville, Kentucky; Rock Island, Illinois; and Davenport and Dubuque, Iowa. The future had never looked brighter.

FULL STEAM AHEAD

In addition to supplying engine parts for the booming steam-powered locomotive railroad industry, Crane took on additional lines, including the manufacturing of wrought iron pipe, fittings, and valves, as well as steam-warming equipment. "From the very beginning," Crane explained, "I put my whole mind upon the business, crowding it systematically and persistently, continually adding to our lines, endeavoring to improve our methods of producing goods, pushing the sales, selecting superintendents, foremen and other help, systematizing and specializing the work." Again, he needed more experienced workers, and in the spring of 1857 Crane went to New York to hire an expert in the new field of steam heating, A.B. Hay. Steam was powering the booming industrial economy, and the young entrepreneur foresaw that the demand for the new heating systems would grow as the nation's population escalated. The fabrication and installation of steam-heating equipment in private houses and other buildings became an important new line of business for Crane and brought him into contact with most of the city's leading businessmen, including the legendary meatpacking baron, Philip D. Armour. "I think that everyone with whom I came into contact," said Crane, "soon became convinced that I was honorable in all my dealings."

In 1858, Crane landed his first major contract to supply the steam-heating system for the Cook County courthouse in Chicago. The $6,000 contract was the largest of its kind in that region and "turned out to be a very successful piece of work," Crane said—one that gave the Company "quite a reputation and placed us in a first-class position in that line of business."

Cook County courthouse, Chicago, where the first Crane valves were installed in 1858.

GROWING PAINS

The outbreak of the Civil War in 1861 proved to be another major turning point for R.T. Crane & Brother. Not long after the first shots were fired at Fort Sumter, the U.S. government placed large contracts for infantry and cavalry equipment with saddlery makers in Chicago, which required a variety of brass fittings. "We were able to secure a great amount of this work," Crane recalled, as well as orders for wagon equipment for the Union army. As is often the case during wartime, the enormous demand by the government during the Civil War "soon created a tremendous boom in business generally, and we went along flourishingly in all lines during that period."

Crane's iron pipe business was also growing to such an extent during this era that R.T. and Charles decided to build a separate iron foundry, launch a machine business, and manufacture steam pumps. By 1864, the Company had outgrown its facilities once again. "We then decided," said R.T., "that the great success which we had met with in our business warranted us in making a radical change and branching out on a very much larger scale, so that our business would be placed on a broader and more solid basis." He and his brother were determined "to place our plant in advance of all others in the country in the variety and quality" of the goods they produced. To succeed in this endeavor required them "to anticipate the wants of the trade—that is, instead of lagging behind, to bring out in advance articles that I could see would be needed, which my experience in the steam-fitting line has enabled me to do for many years." The capacity not only to meet the demands of the marketplace but to anticipate their customers' needs became a hallmark that has endured at Crane Co. for 150 years.

They built a grand factory at 10 North Jefferson Street in 1865 that housed the first malleable iron foundry west of Pittsburgh and served as the Company's headquarters until 1915. They then began to turn out a full line of fittings—both cast-iron and malleable—"a rather new art" at that time, according to R.T., that "was looked upon as quite a mysterious and scientific operation." They began to build engines and went

Main entrance, 10 North Jefferson Street.

Frontispiece of 1874 Crane Catalog showing factory at 10 North Jefferson Street, built in 1865. Rear addition was added in 1870.

CRANE ELEVATORS

Crane got into the elevator business in 1867, and left its imprint in the field with a number of inventions that went a long way in building the public's confidence in the 'elevator machine.' In addition to safety features, Crane invented an operating lever, which did away with the hand cable method of operating a car. From 1867 to 1898 Crane manufactured eleven types of elevators. They ranged from early steam freight jobs to the then deluxe electronic models. It was R.T. Crane's opinion that "Unquestionably, we produced a greater variety of elevators and did ten times more to develop this line of machinery than all other manufacturers combined."

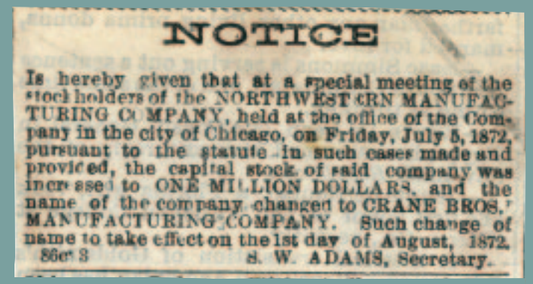
more fully into the manufacturing of steam pumps. With every stage of expansion, Crane sought to stay one step ahead of the marketplace with innovative new products and searched for excellent men with solid experience—and found them.

Another panic followed on the heels of the Civil War, this one triggered by conversion from the gold standard to greenbacks, generating great financial uncertainty. "Business was decidedly depressed," R.T. explained, so "we went ahead adding anything [to our lines] that we could make to advantage." They began making larger engines, including blower engines fueled by coal to fire enormous blast furnaces, and pioneered the first engine with a balanced piston valve as a substitute for the customary sliding valve. They produced steam-powered engines for such important clients as Marshall Field & Company, Chicago's first department store, as well as fire hydrants, ventilating fans, various machine tools, and water pumps.

In 1867 Crane steered the firm into yet another new line of production: steam-powered elevators, a natural extension of the Company's growing prowess in steam-engine production. A few years later, they began to manufacture passenger elevators. With the addition of specially designed valves, they produced the finest hydraulic elevators of that era. Manufacturing eleven pioneering types of elevators, this line grew so successful that R.T. Crane decided in 1886 to incorporate this business separately as the Crane Elevator Company. Innovations included a hand lever with an auxiliary valve and a retarder that gave the operator speed control and flexibility, as well as a double door to facilitate loading and unloading. Because Crane decided to concentrate on industrial manufacturing and production rather than installation and maintenance, the Crane Elevator Company was sold in 1898 and merged with a number of other companies to form the Otis Elevator Company.

This notice announced that the Chicago Board of Trade building had installed four Crane hydraulic elevators.

On February 14, 1865, R.T. Crane & Brother was incorporated in Chicago and changed its name to the North Western Manufacturing Company.



NOTICE

Is hereby given that at a special meeting of the stock holders of the NORTHWESTERN MANUFACTURING COMPANY, held at the office of the Company in the city of Chicago, on Friday, July 5, 1872, pursuant to the statute in such cases made and provided, the capital stock of said company was increased to ONE MILLION DOLLARS, and the name of the company changed to CRANE BROS. MANUFACTURING COMPANY. Such change of name to take effect on the 1st day of August, 1872.

86c3 S. W. ADAMS, Secretary.

Upon the retirement of Charles S. Crane in 1872, R.T. changed the name of the firm to Crane Brothers Manufacturing Company out of respect for his brother .

Finally, the name of the firm was officially changed to Crane Company on January 29, 1890, and became commonly known as Crane Co.

Malleable iron foundry at South Canal and Fifteenth Streets in Chicago, where conveyor molds were in use.

CRANE TO THE RESCUE

In 1871 the Great Fire of Chicago spared Crane's facilities, situated on the west side of the river, away from the raging winds that spread the flames that took three hundred lives, destroyed nearly eighteen thousand buildings, and left some hundred thousand people homeless. Possessed of a keen social conscience and sense of civic duty, Crane decided it was time for his company to begin to repay a debt to the city that had given an extraordinary opportunity to a penniless young man. "At the time of the Chicago Fire," said Crane, "the only water works the city had were at the foot of Chicago Avenue, and as they were destroyed by the fire, the city was entirely without water. I suggested to the city authorities that we put in a number of our large steam pumps on the river and pump into the mains and in that way give them a little water." The city gratefully accepted his proposal, and Crane placed several of the Company's larger pumps at the foot of Madison Avenue. "We obtained steam for these pumps from a locomotive and ran them continuously night and day until the city pumps were again running." Long before the term "corporate responsibility" entered business jargon, he believed that "the possession of great wealth brought with it a great obligation," and this service to the city was but the first of many acts of civic responsibility and charity that Crane Co. would perform in the generations to come.

Before long, Chicago began the arduous task of rebuilding, which brought a tremendous amount of business to the city's architects and builders—and to Crane. As the city's population swelled from half a million in 1880 to a million in 1900, Chicago built outward as well as upward, creating the nation's tallest skyscrapers. Taller buildings required more piping for water and steam, as well as larger and more durable valves to withstand greater pressures.

A sharp increase in competition and the need for labor-saving machinery during the post–Civil War era necessitated the development of a mass-production system in the Company's factories. The Company's engineers devised a steam-powered conveyor system for moving metals and molds and for pouring hot molten metals, and constructed a merry-go-round casting machine, a large revolving wheel that turned once for loading and again for molding. The first significant improvement in the molding process in centuries, this innovative line production system is believed to be the first in the metal-working field.

Chicago in Flames—The Rush for Life Over the Randolph Street Bridge, 1871 (Harper's Weekly *from a sketch by John R. Chapin). Chicago Historical Society.*

CRANE CHICAGO PROPERTIES

BEFORE THE GREAT WORKS

1 Original Foundry, SW corner of Fulton and Canal, 1855

2 Lake Street Factory, 102 W. Lake Street, 1856

3 Lake Street Factory expansion, 104 W. Lake Street, 1862

4 Iron Foundry, 52-54 N. Jefferson Street, 1863 *(not pictured)*

5 Pipe Mill, NW corner Desplaines and Fulton streets, 1864

6 10 N. Jefferson Street, 1865

7 with additions built 1870

8 Judd Street Pipe Mill, Judd Street and Fort Wayne railroad tracks, 1881 (rebuilt 1887, see 10 below and image opposite)

9 Crane Elevator Company, 219 S. Jefferson Street, 1886

10 Malleable Iron Foundry, Judd Street and Fort Wayne railroad tracks, rebuilt in 1887 following fire.

11 Judd Street Factory (Iron Foundry, Fittings), 1891

12 Twelfth Street Factory (Iron Valves), 1899

13 Nipple Department, Fourteenth Street, 1902

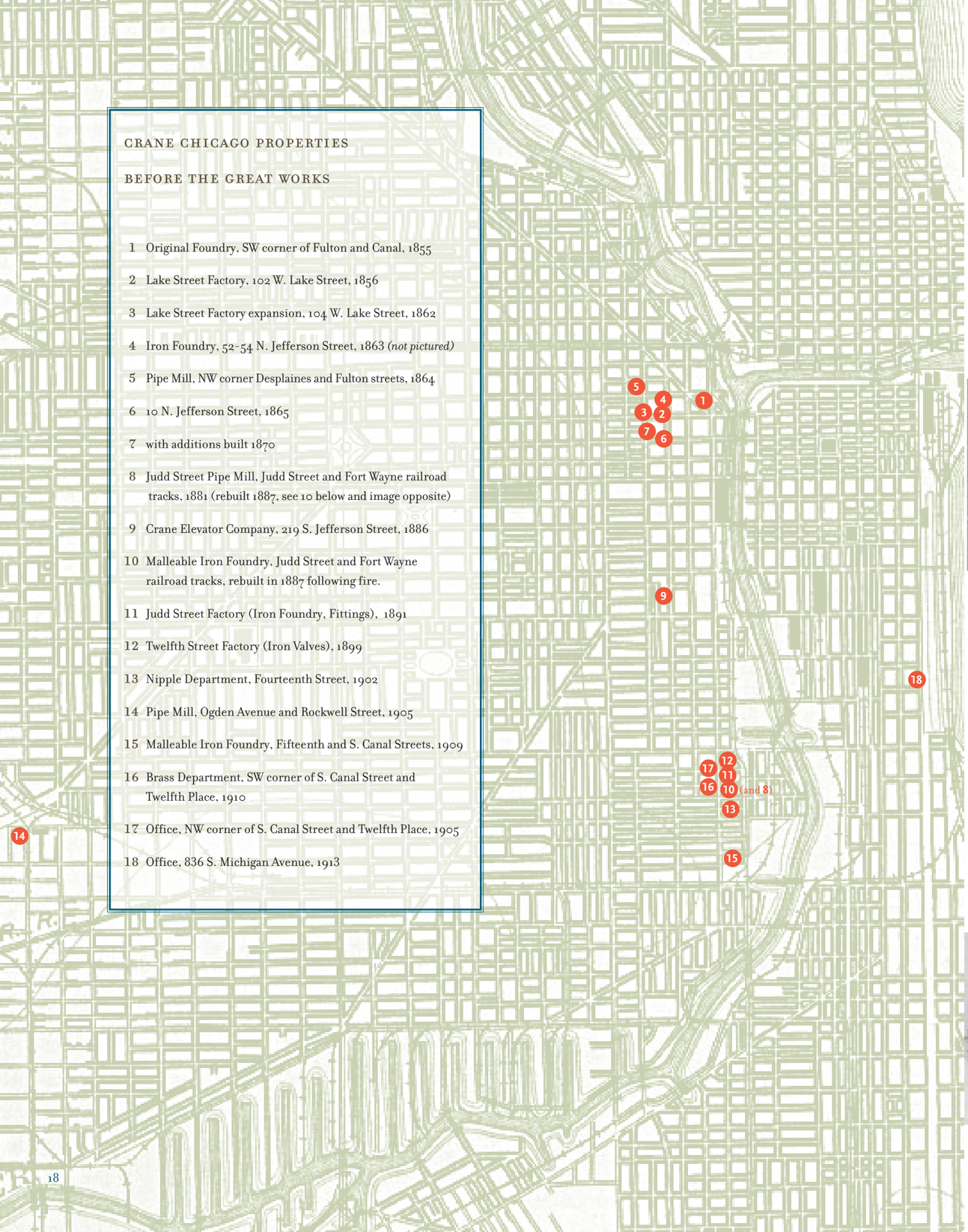
14 Pipe Mill, Ogden Avenue and Rockwell Street, 1905

15 Malleable Iron Foundry, Fifteenth and S. Canal Streets, 1909

16 Brass Department, SW corner of S. Canal Street and Twelfth Place, 1910

17 Office, NW corner of S. Canal Street and Twelfth Place, 1905

18 Office, 836 S. Michigan Avenue, 1913



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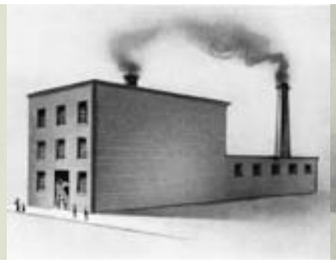

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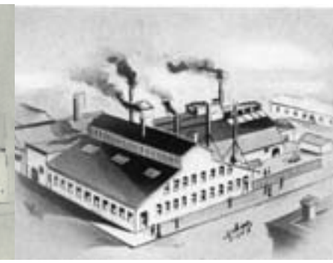

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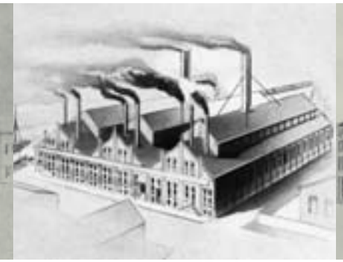

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EXPANSION ACROSS THE NATION

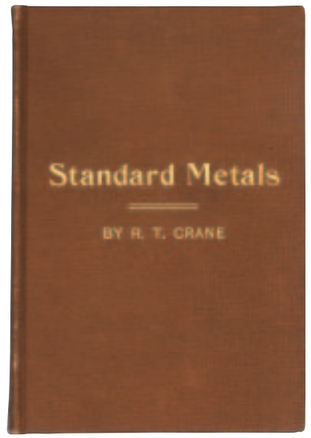
Between 1825 and 1900 the population of the United States surged from 5 million to 76 million, fueled by a massive influx of immigrants searching for the American dream. Crane Co. grew at pace with the nation, acquiring the business of a jobber in Omaha, Nebraska, in 1884, which grew so successful that it became the Company's first branch office. In 1886 a second branch was opened in Los Angeles. "The success of these branches," said R.T., "led to the determination to start others and make branch houses a permanent and important feature of the business." Crane opened branch offices throughout the country, and by the late 1880s, the Company's works included four separate operating facilities and employed more than fifteen hundred people.

The United States had become the world's greatest manufacturing nation, and large oil and railroad trusts were consolidating much of the nation's newfound wealth and power. Wider gas and oil distribution called for superior fluid-control equipment to meet the new temperature, pressure, and size requirements. Anticipating these new engineering challenges, Crane established a laboratory in 1888 to help formulate metallurgical standards for the tensile strength of iron and steel.

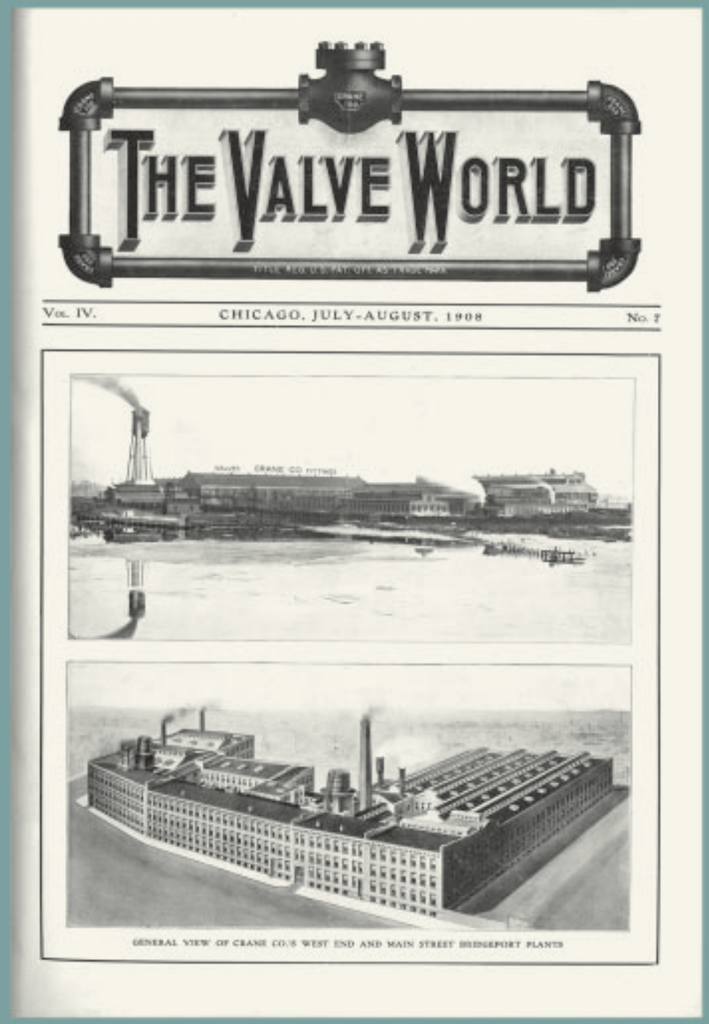
By 1890, Crane Co., as the firm was officially called, entered yet another cycle of tremendous growth, "largely due," according to R.T. Crane, "to the wonderful advantages that electricity was found to possess." Edison's pioneering discoveries were generating a great demand for much larger steam engines to generate electricity for the distribution of power and light. To withstand the unprecedented levels of pressure produced by these engines, larger and more efficient Crane products had to be developed. High-pressure piping required steel fittings and valves instead of traditional cast iron, so the Company decided to find a way to build its own steel foundry.

The founder's oldest son, Charles R. Crane, who joined the family business at the age of ten, had learned of a German inventor named Zenzes who had patented a small steel converter that would facilitate the manufacturing of the quantity of steel the Company required. In 1907 the Company sent its chief metallurgist to Germany to investigate and negotiate the rights to the patent. He succeeded and brought back the inventor as well. Crane then built the first steel-casting center in the Chicago area and, within three years, began to manufacture valves and fittings with a minimum tensile strength of 60,000 pounds per square inch (psi).

The first branch office, Omaha, Nebraska, 1884 .



R.T. Crane published this text in 1896 on where metals are found, the manner of their production, their character, and their uses in mechanics.

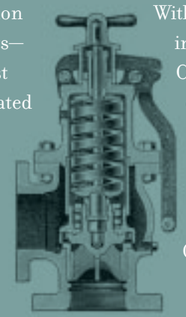

THE VALVE WORLD

VOL. IV. CHICAGO, JULY-AUGUST, 1908 No. 7

GENERAL VIEW OF CRANE CO.'S WEST END AND MAIN STREET BRIDGEPORT PLANTS

The Bridgeport Works

The thriving economy and Industrial Revolution were driving standards of living to new heights—indoor plumbing could be found in all the best homes. Bathrooms and central heating translated into new uses of Crane piping, valves, and fittings. During the early 1900s Crane Co. introduced pop safety valves and drainage fittings, full lines of steam and oil separators, and a large variety of safety valves.



Crane Marine Pop Safety Valve

With the Company's fluid-control business thriving, in 1903 Crane acquired the Eaton, Cole & Burnham Company of Bridgeport, Connecticut—a well-established valve and fitting manufacturer with a product line that rivaled the Company's own. R.T. Crane anticipated the need for a greater East Coast presence and greatly expanded the Bridgeport Works, which became the Crane Valve Company.

October 9, 1893 was "Chicago Day" at the World's Columbian Exposition. That day, 716,881 people attended to commemorate the anniversary of the Great Chicago Fire of 1871. Chicago Historical Society.

THE WHITE CITY

The World's Columbian Exposition, held in Chicago in 1893, celebrated the four hundredth anniversary of Columbus's discovery of America. The exposition occupied 630 acres in Jackson Park and the Midway Plaisance, and some 27.5 million visitors came from around the world to see such new marvels as the Ferris wheel and a city within a city lit entirely by electricity.

Crane Co. proudly exhibited its new line of air brakes for the locomotive industry at the great Chicago World's Fair, known throughout the world as the "White City," for its graceful neoclassical white buildings. "We showed equipment for fifty cars," said R.T. Crane, "which was placed under working conditions. The exhibit was a very elaborate and beautiful one and attracted much attention." George Westinghouse, inventor of the air brake and founder of Westinghouse Electric in 1886, visited the White City and undoubtedly saw that exhibit. He had been growing uneasy over the position Crane Co. was attaining as his competitor in this line. Westinghouse asked R.T. Crane to abandon the air brake business in the United States "and join him in the manufacture of this and other lines of goods in Russia." A firm believer in treating competitors fairly, Crane agreed, and together they built "extensive factories" in St. Petersburg.


R.T. CRANE CO. SPECIAL EDITION CHICAGO AMERICAN R.T. CRANE CO. SPECIAL EDITION

12,000 AT CRANE REUNION

R. T. CRANE, SR. AND HIS OLDEST EMPLOYES

YANKEE LEADING RUSS MUTINEERS?

1000 KILLED BY CYCLONE IN TEXAS, 3 TOWNS DESTROYED

Company anniversaries were festive occasions at Crane. One of the most notable was the Fiftieth Jubilee Celebration on July 6, 1905. R.T. Crane reserved sixteen special trains to carry the employees from Chicago's Northwestern Station to Northwestern Park in Des Plaines, where the Jubilee picnic was held. A special edition of the Chicago Evening American*, published in honor of Crane's anniversary, detailed the Jubilee activities. R.T. Crane (overleaf) talked that day about his profound happiness at being there with his employees and the values that bound them all together. The cast metal elephant (below) was crafted as a keepsake of the anniversary because, as was reported in the Jubilee edition of Valve World, "We think it stands for character, intelligence, and strength."*

PROMOTING THE SAFETY, HEALTH, AND WELFARE OF EMPLOYEES

As with other Crane Co. facilities, extraordinary precautions were taken at the Bridgeport Works to protect the health and safety of employees and to guard against accidents through such measures as the abandonment of the belt drive for operating machinery and the introduction of a vast number of ingenious safety devices. In the early 1900s, an inspector for an industrial insurance company asked permission to visit the works and observe what safety appliances had been devised, with the intention of bringing them to the attention of other manufacturers in similar lines. When the inspection was complete, the inspector pronounced the safety devices at Crane Co. the most complete he had ever seen in any of the iron and steel industries.

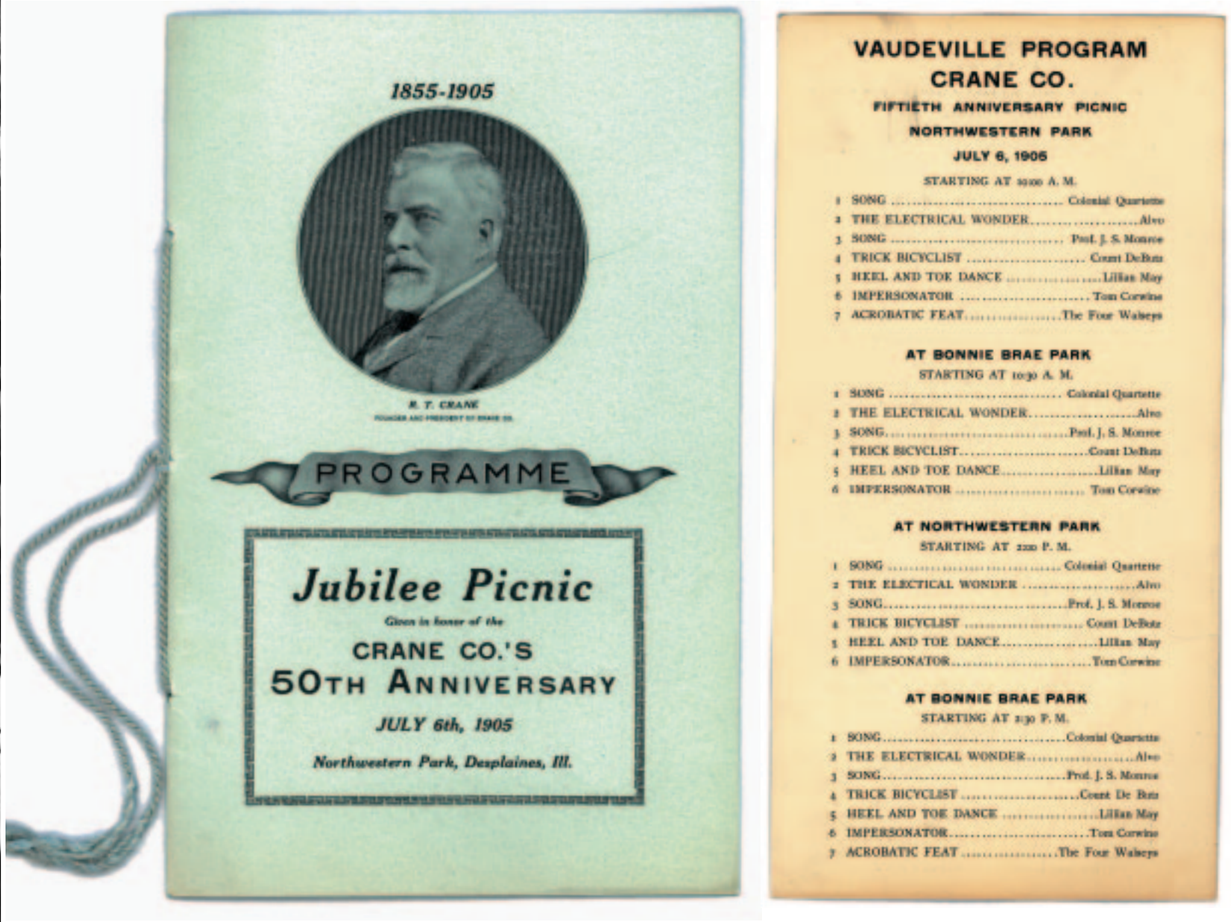
On July 6, 1905, sixteen specially reserved trains with ten cars each carried five thousand Crane employees, families, and friends to a jubilee picnic to celebrate the Company's fiftieth anniversary. R.T. Crane told the crowd gathered there that "no employer, I am sure, has ever been surrounded by a more loyal, honest and faithful body of workmen or executive corps than I have had, and I feel that my success has largely been due to this fact." In order to earn that kind of loyalty, R.T. believed it necessary to treat his workers "most honorably and fairly." John B. Berryman, who had joined the Company in 1892 and later became president, described the "old man" as "brusque and hard-boiled like many others who came up the hard way, from poverty to riches, but underneath he had a warm spot for the men in the shops."

According to one historian, "he was one of the first to introduce the eight-hour day in his factories, initiating the 5-cent lunch program with hot coffee and soup for his men, providing free medical care for his workers and their families, and developing liberal profit sharing and pension plans long before other employers even considered such ideas." The deep interest that he took in the welfare of his employees was legendary, Vice President A.M. Gilbert told a meeting of stockholders in 1894. Even during the Panic of 1893, when times were hard for Crane Co. and American industry in general, R.T. Crane tried "in every way to make their [the workers'] burdens as light as possible" and was "always ready in good times to go farther in dividing profits than any other man that we know, and that when hard times come, his first thought is to make the burden easy on the men as prudent management will admit of."

"The oldest man on the job," as R.T. Crane called himself, passed away at the age of seventy-nine in 1912, leaving control of the family business in the hands of two of his sons, $1 million in trust to be added to his workers' pensions, and another $1 million for their widows and children. Under his hard-driving management, Crane Co. had grown to more than ten thousand employees, forty-three branch offices scattered across the country, and a product line of more than sixteen thousand articles used throughout the world for use in connection with steam, water, gas, and air. From the factory floor to the boardroom, the lengthy shadow of R.T. Crane would continue to fall across the organization for many generations to come.

The Works of the Westinghouse Company, Ltd., at St. Petersburg, Russia, circa 1890, where R.T. Crane went into business with George Westinghouse to build air brakes for trains.

On July 6, 1905, sixteen trains of ten cars each carried the Company's employees, their families, and their picnic baskets to Northwestern Park (sixteen miles from Chicago on the banks of the Des Plaines River) to celebrate the Company's Fifty-Year Jubilee. Richard Teller Crane was a man ahead of his time, who, that day, talked about the values that bound them all together and about his profound happiness at being there with his employees to commemorate their company's fifty years of growth since its founding as a one-man brass and bell foundry.



Jubilee Picnic Program

"CRANE PICNIC SONG"

JULY 6, 1905

NOTE.—MR. J. S. MONROE WILL SING THE VERSE, THE QUARTETTE WILL SING THE CHORUS, AND EVERYBODY IS REQUESTED TO JOIN IN THE REPEAT CHORUS AFTER EACH VERSE.

1 The boys that work for Crane,
Are good at almost any kind of game;
Baseball, Running, Tug of War,
Wheelbarrow Race and Horizontal Bar;
They meet, just once a year,
At making friends and filling hearts with cheer;
And every one is expected to sing,
So all join in and make the welkin ring.

CHORUS—(Quartette.)

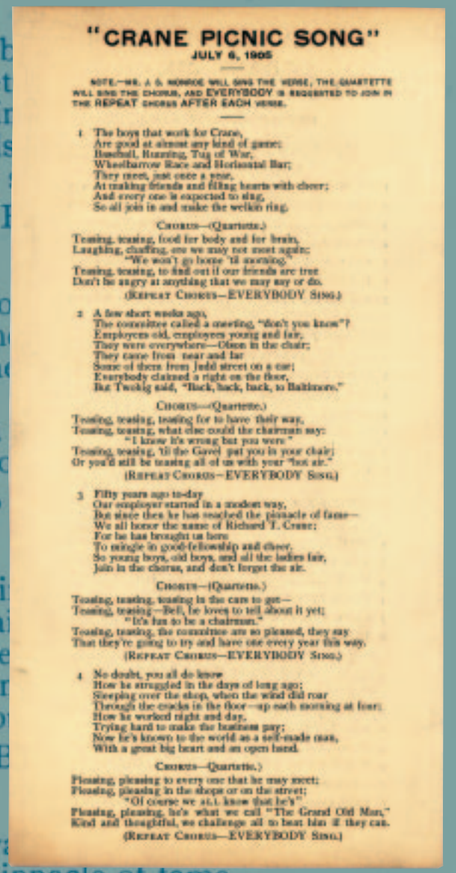
Teasing, teasing, food for body and for b
Laughing, chaffing, ere we may not meet
"We won't go home 'til mornin
Teasing, teasing, to find out if our friends
Don't be angry at anything that we may
(REPEAT CHORUS—EVERYB

2 A few short weeks ago,
The committee called a meeting, "do
Employees old, employees young an
They were everywhere—Olson in th
They came from near and far
Some of them from Judd street on a
Everybody claimed a right on the flo
But Twohig said, "Back, back, back,

CHORUS—(Quartette.)

Teasing, teasing, teasing for to have thei
Teasing, teasing, what else could the chai
"I know it's wrong but you we
Teasing, teasing, 'til the Gavel put you in
Or you'd still be teasing all of us with yo
(REPEAT CHORUS—EVERYB

3 Fifty years ago to-day
Our employer started in a modest wa
But since then he has reached the pinnacle of fame—
We all honor the name of Richard T. Crane;
For he has brought us here
To mingle in good-fellowship and cheer.
So young boys, old boys, and all the ladies fair,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Baseball, Running, Tug of War,
Wheelbarrow Race and Horizontal Bar;
They meet, just once a year,
At making friends and filling hearts with cheer;
And every one is expected to sing,
So all join in and make the welkin ring.

CHORUS—(Quartette.)
Teasing, teasing, food for body and for brain,
Laughing, chaffing, ere we may not meet again;
"We won't go home 'til morning."
Teasing, teasing, to find out if our friends are true
Don't be angry at anything that we may say or do.
(REPEAT CHORUS—EVERYBODY SING.)

2 A few short weeks ago,
The committee called a meeting, "don't you know"?
Employees old, employees young and fair,
They were everywhere—Olson in the chair;
They came from near and far
Some of them from Judd street on a car;
Everybody claimed a right on the floor,
But Twohig said, "Back, back, back, to Baltimore."

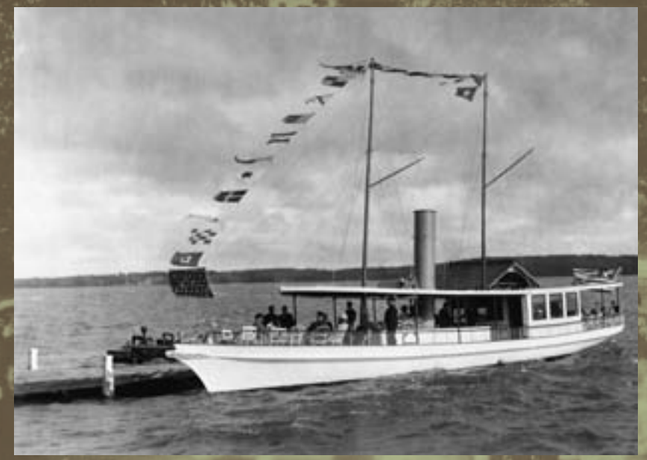
CHORUS—(Quartette.)
Teasing, teasing, teasing for to have their way,
Teasing, teasing, what else could the chairman say:
"I know it's wrong but you were "
Teasing, teasing, 'til the Gavel put you in your chair;
Or you'd still be teasing all of us with your "hot air."
(REPEAT CHORUS—EVERYBODY SING.)

3 Fifty years ago to-day
Our employer started in a modest way,
But since then he has reached the pinnacle of fame—
We all honor the name of Richard T. Crane;
For he has brought us here
To mingle in good-fellowship and cheer,
So young boys, old boys, and all the ladies fair,
Join in the chorus, and don't forget the air.

CHORUS—(Quartette.)
Teasing, teasing, teasing in the care to get—
Teasing, teasing—Bell, he loves to tell about it yet;
"It's fun to be a chairman."
Teasing, teasing, the committee are so pleased, they say
That they're going to try and have one every year this way.
(REPEAT CHORUS—EVERYBODY SING.)

4 No doubt, you all do know
How he struggled in the days of long ago;
Sleeping over the shop, when the wind did roar
Through the cracks in the floor—up each morning at four;
How he worked night and day,
Trying hard to make the business pay;
Now he's known to the world as a self-made man,
With a great big heart and an open hand.

CHORUS—(Quartette.)
Pleasing, pleasing to every one that he may meet;
Pleasing, pleasing in the shops or on the street;
"Of course we all know that he's"
Pleasing, pleasing, he's what we call "The Grand Old Man,"
Kind and thoughtful, we challenge all to beat him if they can.
(REPEAT CHORUS—EVERYBODY SING.)



Background: Children's races at Northwestern Park.

Top: R.T. Crane's boat, Passaic, *on Lake Geneva.*

Center: Mrs. R.T. Crane (center) gave a house party at the Crane's summer home, Jerseyhurst, Lake Geneva, for the branch house managers and their ladies, in honor of Mr. Crane's Jubilee, July 4 and 5, 1905.

Right: A quartet sang the "Crane Picnic Song." The employees presented Mr. Crane with this large floral reproduction of the small metal elephant that Crane Co. gave away as a souvenir of the fiftieth anniversary.

Opposite: Lyrics for the "Crane Picnic Song" were printed in the program.

RICHARD TELLER CRANE (CENTER), WITH SON R.T. CRANE, JR. (RIGHT), AND GRANDSON R.T. CRANE III (LEFT), SON OF CHARLES R. CRANE, IN 1910.

CHAPTER TWO

Expanding Horizons

"IT IS MY HOPE," R.T. Crane wrote to his sons in a letter that accompanied his will, "that they will continue the work I have started." He urged his oldest son, Charles Richard, and his youngest, Richard Teller Crane, Jr., to keep a firm grasp on the family's far-flung and thriving industrial empire—"the grandest one ever built up by any person." During his lifetime, the founder had already given away a good portion of his substantial personal fortune to his seven surviving children, and had bequeathed the Company (capitalized at $17 million) in equal shares to Charles and R.T. Jr. Both sons, however, were eager to take control of the family business, and a controversy over the terms of their father's will erupted between the two. The firstborn son, Charles, believed it was his natural right of succession to take over the leadership of the Company, while R.T. Jr. believed he was better able to manage it.

The R.T. Crane Manual Training High School was named in honor of the founder of Crane Co. in 1905. Richard Teller Crane penned several controversial treatises and articles criticizing higher education, which he believed was out of reach for the children of the working class. He favored basic education with practical, hands-on "mechanical" instruction for everybody as opposed to higher education for a select few from well-to-do families. He introduced manual training to Chicago's grade schools in 1891, established five such schools during his lifetime, and donated liberally for scholarships to help train public schoolteachers in mechanical instruction. Chicago Daily News *negatives collection, Chicago Historical Society.*

THE SCHOOL OF LIFE

That controversy was resolved for the time being at the annual meeting of the board of directors in January 1912 with the election of Charles R. Crane as president (on a provisional basis) and Richard as first vice president. Born in 1858, Charles had followed closely in his father's footsteps, joining Crane Co. as an apprentice at the tender age of ten. He worked in various parts of the Crane foundry in Chicago during school vacations and sometimes after school. "The years among the workmen," Charles later recalled in his memoirs, "when I myself was a workman, were a real education. In the later conduct of the business I could understand and sympathize with the workman's point of view and could talk with him in his own language."

Of all the Crane children, Charles's formal education was the least complete. He had spent a short period at the Rush Medical School in Chicago, working at the factory after class. At the age of nineteen he enrolled in the Stevens Institute in Hoboken, New Jersey, to study engineering, but never graduated. His father's deep and highly publicized disdain for higher education may have kept him from sending Charles to university for a liberal arts degree. "I have made my way with my hands and head with little of the learning of books," R.T. Crane told the *Chicago Tribune* in 1907. "If I, taking up the world's work at nine years old, could become a millionaire manufacturer, what's the use of education beyond the three R's, if a boy is going into business?"

While attending the Stevens Institute, Charles fell ill with malaria, although one biographer asserts that he was actually "allergic to formal education." R.T. Crane suggested that he leave Stevens and travel the world to rest and recover. "Of course," his father said, "I shall expect you to travel seriously and to make it part of your general education." Travel seriously he did. He visited Russia twenty-three times, sailed to Java when he was twenty-one, crossed Siberia by train before passengers were even allowed, and lost forty pounds during an arduous six-week trip across Turkey on horseback. *Time* magazine followed his exploits closely and labeled him "Sinbad the Sailor" and "a successful Ponce de Leon who continually finds lost, shining cities." He lived a life so remarkable that he served as the prototype for characters in at least three thrillers crafted during his lifetime. Much like his father, who, Charles believed, had a "great natural brain entirely unspoiled by education," he also had a deep-rooted passion for learning through "vital human experience." He began a lifelong quest to educate himself, fueled not only by travel, but also by a voracious appetite for books on art and music, as well as language and a host of other subjects.

During the 1890s Charles became closely involved in Chicago's municipal affairs and the city's political reform movement, and by the turn of the century was becoming well known not only as a businessman, but also as a civic reformer, a philanthropist, and a widely traveled and knowledgeable specialist in Middle Eastern and Russian affairs. President William Howard Taft had tapped him for public service as minister to China

Charles R. Crane

CHARLES RICHARD CRANE (1858—1939)

Charles Richard Crane was one of the most cultured, well-traveled, and generous men of his generation. From peasants to kings, he made friends easily wherever he traveled and was tapped by two presidents for his diplomatic skills. President Woodrow Wilson sent him on his first diplomatic mission to Russia, where he witnessed the unfolding revolution in 1917, then sent him on an assignment to Turkey, which led to the "Crane-King Report." Crane even assisted in the birth of a new nation—Czechoslovakia. In 1920 Wilson named Charles ambassador to China—the proudest moment of his career. An unorthodox diplomat who tired easily of routine and administrative chores, he spent much of his time in China on the road, where he heard rumors of an impending famine. Friends and colleagues tried to dissuade him from interfering in such a routine disaster in which "millions of people will suffer and millions will probably die." Charles, however, said that he "could not be convinced that Americans ever tired of well-doing and there was no time to lose if seed were to be secured and planted in time for a harvest." Crane got the cooperation he needed from four foreign governments and averted a devastating famine. "I've been on the inside of many interesting jobs in my life," said Charles looking back over his career shortly before his death in 1939, "but the best job I ever did was organizing the famine relief in China."

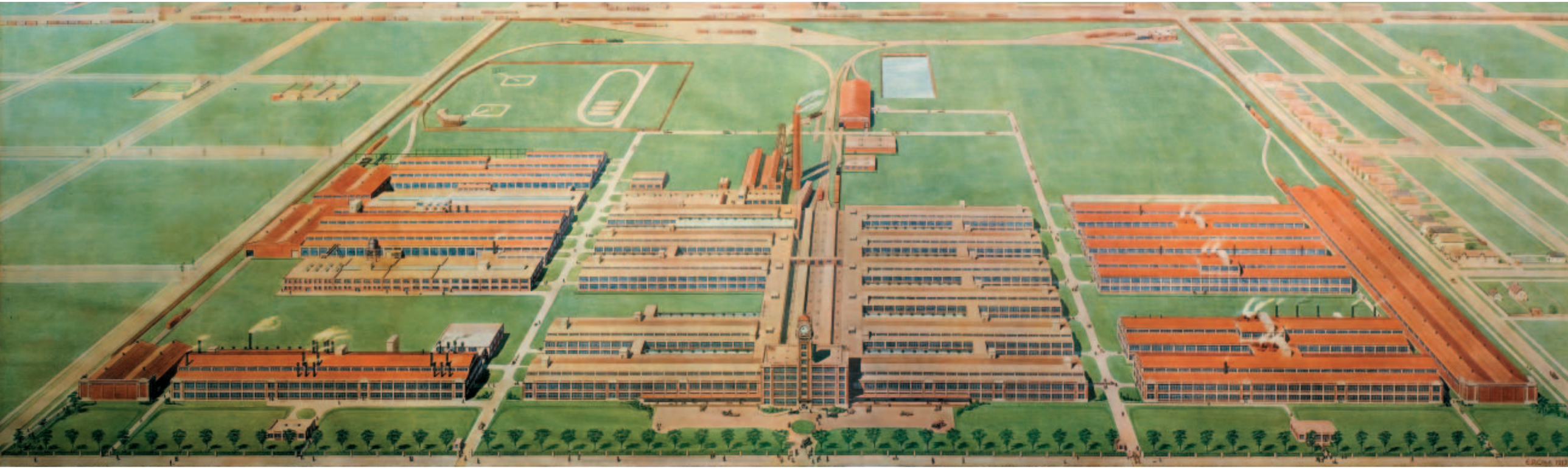
Like their father, Charles and his brother Richard were both prominent philanthropists. In the letter accompanying his will, R.T. Crane urged his children to "devote a liberal share of their spare time to the interests of charity." Charles donated generously to hospitals and schools, musicians, and artists such as Alphonse Mucha; he funded a chair in Slavic studies at the University of Chicago and supported the Marine Biological Laboratory at Wood's Hole, Massachusetts. He sent a mining engineer to Saudi Arabia to search for water as a gift to his friend Ibn Saud; he found oil instead, and some credit Crane with the development of the oil industry in that country. He was also a cofounder of the Institute of Current World Affairs (ICWA), which continues to provide fellowships to individuals for international study.

March 9, 1931. TIME Magazine © 1931 Time Inc. Reprinted by permission.

in 1909, but the chairman of the Senate Foreign Relations Committee, Philander Knox, blocked his appointment. He became Woodrow Wilson's single largest campaign supporter in the election of 1912, and President Wilson's first visitor to the White House following his inauguration was none other than Charles R. Crane. Wilson offered him a position as ambassador to Russia, but Charles felt obliged to decline because he had just succeeded his father as head of Crane Co. It was not the last such offer his close friend and lifelong associate Wilson would make to him.

Although travel and politics remained lifelong passions, Charles spent most of the years between 1878 and 1914 working at Crane Co. He threw himself fervently into the role of leader and dedicated significant energy into expanding the business by opening three new branches. Sales reached an all-time high of $40 million in 1913, but then dipped to $39 million the following year at the outbreak of World War I. "We struck a very sharp depression," explained John B. Berryman, who later became president of Crane Co. "The business outlook was cloudy and did not invite expansion. We marked our time."

Richard Teller Crane preferred an evening of quiet solitaire to one of social activity. On the cover of Time, *opposite, Charles R. Crane emulated his father.*



The Great Works (also known as the Chicago Works) clock tower was a landmark of the soutwest side of Chicago and a timepiece of the community.

THE GREAT WORKS

However, one very important matter remained on the table following the founder's death that required substantial amounts of capital. R.T. Crane had never fully envisioned the degree to which the Company would expand, and for the fifty-seven years he led the business, he simply acquired new properties until he had amassed land and buildings scattered throughout Chicago (pp. 18–19). Charles and Richard believed the time had come to consolidate Crane's operations and worked closely to sell a number of Crane properties and select a site for the new plant they intended to build. To their good fortune, the C. B.& Q. (Chicago, Burlington and Quincy) Railway was searching for a new right-of-way through Chicago and expressed interest in some of the Crane Co. properties. The Crane brothers happily agreed to the sale. And in short order, they found the perfect 160-acre parcel on Kedzie Avenue in Corwith, in the heart of Chicago's vast southwest-side industrial district, where they began to build their extraordinary new factory.

The "Great Works," as the plant was called, cost Crane $12 million and contained forty-seven separate buildings with a total of seventy-two acres of floor space. Infinite pains were taken to create a plant that not only would be mechanically correct, but would thrive for several generations. The men handling the project traveled far and wide to study the most modern plants already built or under construction. Working closely with architects Graham, Anderson, Probst & White, Crane engineer W.W. "Bill" Doolittle deserves much of the credit for the layout and plans for the movement of raw and finished materials throughout the enormous site, as well as for the custom design of much of the interior equipment. Operations began in 1914, and according to *Fortune* magazine,

> *Nothing could be more efficient than the flow of materials through the Corwith plant. It is laid out on a horizontal traffic system, with raw materials entering on either side, moving toward the center through foundries, machine shops, assembly rooms, and stock rooms. Five railroads serve the plant directly; the main line of the Santa Fe is its boundary in the rear. And Crane has seven miles of tracks on its own property that carry raw materials to the foundries, haul finished goods from the stock rooms.... In its great, high, murky foundries, lighted by the red glow of furnaces and ovens, Crane can produce some 800 tons of forgings and castings a day.*

R.T. JR. TAKES THE HELM

Although the Crane brothers had succeeded in building one of the most modern factories in the United States, controversy over their father's will continued to split the two apart. To settle the matter, their lawyers asked them to submit a closed bid to each other that named a price for buying the other out of the family business. R.T. Jr. made the higher bid; Charles accepted it and agreed to step down in the summer of 1914.

At heart, Charles was neither a manufacturer nor a merchant. He "had a temperament quite unlike his father," recalled one colleague. He was "kindly by nature, considerate and lovable," and "lacked the force and dominating personality of his predecessor." A budding diplomat, Charles R. Crane's deepest interests did not revolve around the family business. His dedication to Crane Co. had already spanned forty-four years; the time had come to devote himself fully to the pursuit of his international interests.

"When Mr. R.T. Crane, Jr. became President," wrote his brother Charles, "he was perfectly clear in his vision as to what his life work was to be. All of his power was to be concentrated on the Crane Co. without any conflicting interests." Unlike his older brother, shy, reserved R.T. Jr. was born to run Crane Co.

Following his graduation from the Sheffield Scientific School at Yale in 1895, he held various positions at Crane, working in steam-fitting and plumbing supplies, followed by a year in the foundries to learn about the business on the factory floor. He then held the city sales desk, where he showed a considerable flair, and in 1898 became second vice president. He was then elected first vice president in 1912, a position he held until the board elected him president in 1914. "The new President," according to Berryman, was "a democratic, approachable gentleman, without any business training, who was taking on a very stiff job. We did not know whether he could handle it."

A CALL TO ARMS

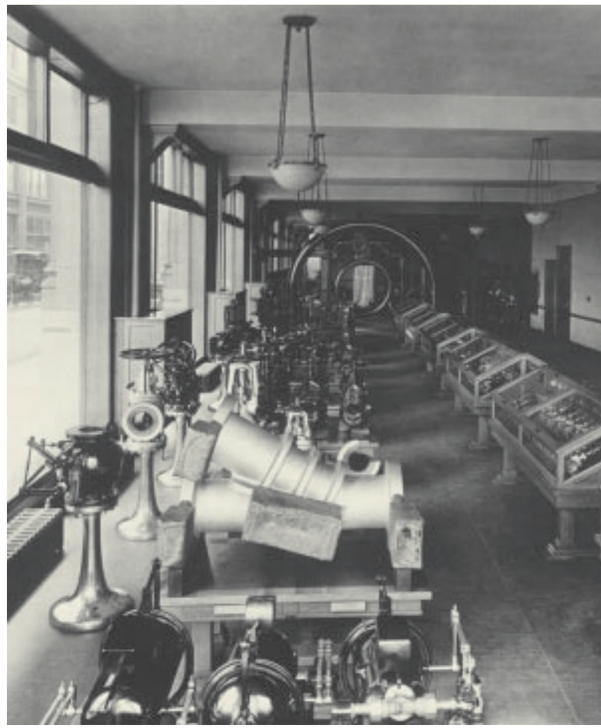
Following the declaration of war between England and Germany in 1914, the business climate declined rapidly both at home and abroad, severely testing the Company's new leader. "Business stopped in the United States," said Berryman, "and our sales began to slide down, like a ship on greased runways." Compounding this problem, construction on the new plant in Chicago had cost far more than the money received for the properties the Company had sold; the plant in Bridgeport needed to be kept humming with regular cash infusions; and Crane had taken on an enormous debt of $15 million to keep all these balls balanced in the air. None of these problems, however, seemed to faze R.T. Jr.

R.T. Crane, Jr., on his private railroad car, upon which he logged up to eighty thousand miles per year visiting Crane locations throughout the United States and Canada.
Chicago Daily News *negatives collection, Chicago Historical Society.*

His optimism was well founded. Sales began to pick up by 1916. And when America entered the war the following year, Vice President John Berryman received a call from Washington asking Crane to help manufacture some munitions, but more important, to provide heating systems and bathroom facilities for the brand-new barracks that would house 4 million soldiers. Luckily, Crane had a very capable man named Franklin in its Washington, D.C., office who was not only an expert in plumbing, but also understood the installation of it. The U.S. government therefore contracted with Crane to supply all the pipe, valves, and fittings needed to heat and provide sanitation to the barracks. Crane kept the equipment flowing as fast as contractors could install it. Profit margins were slim, but the Company considered it a contribution to the conduct of the war.

A flood of new orders also poured in from the U.S. Navy for brass valves for its new vessels, which forced the Company to build an additional foundry. "Even then," recalled Berryman, who was in charge of operations, "we barely kept our heads above water." Commercial shipbuilders were also placing unprecedented demands on Crane for iron body valves, which taxed the Company's facilities to the limit. Yet the firm was fortunate in having in the production end strong people who understood their business—a Crane tradition that has endured since 1855. "As the years pass," said Berryman, "men pass, but the baton is handed on to their successors and tradition and ideals are carried on without a break."

Like his brother Charles, Richard carried on the family tradition of travel but preferred to spend his time roaming the growing Crane empire. "Of him as of his father," *Time* reported, "it is said that he would rather visit a Crane Co. shop than attend a theatre." During inspection trips throughout the United States and Canada, his private railroad car logged up to eighty thousand miles per year. And during those visits he never lost an opportunity to show his concern for the welfare of his employees. "His personal contacts were as many as he could make them," Crane Co.'s magazine *Valve World* reported, "and as varied as the personnel of the Organization. He had one manner, one smile, one hand-clasp, one cheerful word for all—and that one was the simple and natural expression of his genuine interest."



Chicago showroom, 1916

WAR SUPPLEMENT

THE VALVE WORLD

DECEMBER, 1918

Crane Men in the War

UP TO November 11, 1918—The World's Independence Day—when fighting ceased in the Great War, 1631 Crane men had entered the Military Service of the United States. Of these 430 were on the Seas and Over-Seas, the remainder being in the Home Training Camps and on duty in this country. We do not know when all of our boys will be home again, once more a part of our Civil Life, but we most heartily assure them when they come, and as they come, a royal welcome. And we who have kept up the home end of the big fight and have backed you with all our will and strength, send you through the War Supplement our earnest wish that, no matter where you may be, you may have a right Merry and Happy Christmas.

HELPING HANDS

In 1904, R.T. Crane said, "a loyal employee gives something besides his labor and the employer should recognize that fact" and toward the end of his life he set aside $1 million as a fund for "the purpose of taking care of my men." Two years after R.T. Crane's death, members of his family honored his wish by establishing the Crane Fund to "provide a means for giving support to deserving and needy employees after they have, by reason of age or disability, become unable to engage in active work." Today that bequest is worth hundreds of millions of dollars and the Crane Fund, along with two other company-managed charitable trusts, lives on as a lesson in the power of individual leadership and responsibility.

A CORPORATION WITH A SOUL

Like his father before him, Richard Teller Crane, Jr., cared deeply about the welfare of his employees. Under his leadership, the founder's culture of treating employees with trust and respect coalesced. Carrying out the terms of his father's will, he established the Crane Fund in 1914 to aid former employees and their dependents in need of assistance with $2 million in capital stock from the Company. Through that original seed money, the Crane Fund continues to thrive today.

The following year, R.T. Crane, Jr., founded the Veteran League in recognition of the long and faithful service of those employees with twenty-five years or more with the Company. He presented each member with a gold medal bearing the bust of the founder on one side and the engraved name of the employee on the reverse, with a bar awarded for every five years of service. He hosted an annual banquet in their honor at his own expense. "Mr. Crane had few higher or happier moments in his business life than these intimate and friendly contacts with the Company's veteran employees," said one member of the league. Through these informal gatherings he urged them to share his pride in the organization and demonstrate that they were part of a "corporation with a soul." He encouraged them to reflect the high standards of the Company at all times and on every occasion. Like his father, he believed in "fair dealing with the Company's customers; fair dealing with the Company's employees; fair dealing with the Company's competitors."

President Crane then launched the Employee Group Life Insurance Plan in 1917, and provided medical care to workers and their families. Even through hard times, he continued his father's policy of paying a Christmas bonus to employees. Between 1914 and 1922, he gave employees between 5 and 10 percent of their individual earnings—disbursing an overall amount of $11,511,000 to workers during this period.

Members of the 1925 Veteran League gathered for this photo in front of the "Great Works" and the full-scale replica of R.T. Crane's original 1855 foundry erected at the entrance. A replica of the "Old Bell" at 10 N. Jefferson was presented to members of the league in honor of the Company's seventieth anniversary.

All Crane employees benefited from the Employee Group Life Insurance Plan. The Craneman pictured below displayed a 34-inch swing check valve delivered to the Alabama Power Co. in 1917. It weighed 16,280 pounds.

A PLAN FOR EXPANSION

Following the formalization of policies to support the welfare of employees, R.T. Jr. then embarked on an ambitious plan of expansion—both at home and abroad. Before the end of World War I, Crane announced that he intended to open a plant in Canada, which was completed on St. Patrick Street in Montreal in 1918. Canadian operations were then incorporated as a separate entity, Crane Limited. He also engineered the purchase of the Dominion Pottery in St. Johns, Quebec, and a string of other Canadian firms, and opened new branch offices from Halifax to Vancouver.

Much as in Canada, Crane's initial entry into the European market was through a distribution system. The Company opened a branch office in Paris in 1918, and the following year purchased the London-based jobbing business of James E. Bennett, and appointed him managing director of English operations. As Europe began to recover after the war, Crane built a new factory in Ipswich in 1925, about sixty miles outside London, followed by a plant in Paris four years later to produce valves and fittings. Although the UK operation generated profits early on, it was not until the outbreak of World War II that Crane began to find a receptive market in France.

In 1914 Crane issued $15.5 million of first mortgage bonds. When the last of the bonds were retired in 1922, state authorities requested that the bonds be burned in the presence of witnesses before recording release of the mortgage. R.T. Crane, Jr., president, and nine directors watch as the bonds are incinerated in the basement of the Chicago headquarters building.

By 1922, the Company's financial resources were dwindling due to this rapid program of expansion, and additional capital was required to continue the president's plans. Because he greatly desired a large stockholding by employees, he promoted a plan to sell $15 million of preferred stock to them at a very attractive rate of return. To further carry out his idea of employee stock ownership, between 1924 and 1930 he also gave $10 million in stock gifts to employees from his private holdings.

Throughout the Roaring Twenties, American business was at full throttle. Factory production—systematized and energized with new capital—had made the United States the world's industrial leader. Building on his father's legacy of constant adaptation to and anticipation of change, Richard Teller Crane, Jr., tapped into that energy and steered the business through a tremendous period of expansion in America. Returning to Chicago from the West Coast by train in 1928, Crane told his management team, "I want you to establish 50 branches in the next year." An impossible task, they replied. There weren't even fifty good places left, and the Company had neither the resources nor the personnel to make it happen. Crane Co. did establish twenty branches the following year, further straining existing resources. In fact, under R.T. Crane, Jr.'s leadership, Crane added more than one hundred branches to its distribution network.

Crane Co.'s research and development operations also thrived under the aegis of R.T. Jr. Highly regarded for its engineering capabilities, Crane continued to meet the evolving needs of a variety of industries. Increased pressure and temperature requirements of the oil industry called for the casting of valves from alloy steels. Crane engineers therefore developed a number of special alloys for use in combination in a single valve. A Crane first, engineers developed proper precasting heat treatment for each valve part and invented special cryogenic valves for liquid helium plants. Highly corrosive and dangerous, ammonia was becoming widely used as a refrigerant coolant, calling for Crane to lead the industry with a new line of ammonia-resistant valves. With the growth of research and development operations, in 1928 Crane constructed a new building to house the engineering and metallurgical departments, as well as the testing laboratories.

General sales conference held at Crane's first European manufacturing facility, Ipswich, England, in 1930.

Color advertisement that appeared on the back cover of National Geographic *magazine in 1925.*

A HOUSEHOLD NAME

Crane Co. also pioneered into a promising new direction during the twenties by making Americans want a more luxurious bathroom. The Company had been selling plumbing fixtures and trim since 1886, and in 1895 launched a line bearing the Crane name, built (by Kohler and others) to the specifications of the firm's engineers. By the turn of the century, bright white indoor plumbing fixtures were becoming a standard feature in American homes, yet no one had thought about glamorizing the bathroom.

In 1920 R.T. Crane, Jr., did just that. But first, he needed to secure the means of production and in 1921 purchased the Trenton Potteries Company (formerly Mutual Potteries Co.) of New Jersey—a facility that remained operational until 1970. The Company also acquired the Cahill Iron Works in Chattanooga, Tennessee, an iron enamel plant for bathtubs, lavatories, and other bathroom equipment. However, it did not take long to figure out that to produce iron enameled ware at a competitive price at that plant proved an impossible undertaking. Crane therefore built a new plant at Alton Park, just outside Chattanooga, which became the Crane Enamelware Company and produced the Crane bathroom line until 1973.

When the factories at Trenton and Chattanooga were nearly ready to begin manufacturing their own line of "sanitary ware," designers were brought in to create custom-made, colorful, innovative, and distinctive bathroom ensembles that were completely different from the drab, uniformly designed models currently on the market. There was only one thing missing: demand. R.T. Jr. believed that the Company could create a demand for the new luxury bathroom through an aggressive national advertising campaign. Up until this time, this was a world of commodities with little differentiation between products on the market. Competition was through price, yet a subtle shift was in the air. The end of the war had unleashed pent-up demand for new housing, cars, and a host of other goods once out of the reach of the growing middle class. Car companies such as General Motors were beginning to build the concept of brand names, launching in rapid succession the Chevrolet, Pontiac, Buick, Oldsmobile, and Cadillac lines—all of which made the Ford Model T pale by comparison.

Envisioning the future, the Company embarked on a bold consumer advertising campaign in full color in nationally circulated magazines. This in itself was a progressive move, since advertising as well as color printing were still in the early stages of development.

By the mid-1920s, Crane's advertising budget exceeded $1 million annually, a substantial sum in those days. Traveling exhibits housed in a fleet of specially built buses brought the new Crane color bathroom line directly to consumers.

Before long, world leaders were demanding Crane bathrooms. King Hussein of the Hedjaz (now Saudi Arabia) had Crane bathroom fixtures installed in the palace at Mecca. Motion pictures featured lavish bath settings, further fanning the flames of consumer desire. The Imperial Hotel in Tokyo (designed and built by Frank Lloyd Wright) boasted Crane fixtures, and in Chicago, the Drake Hotel, the Field Museum of Natural History, and the 1923 remodeling of Wrigley Field all featured the Crane line.

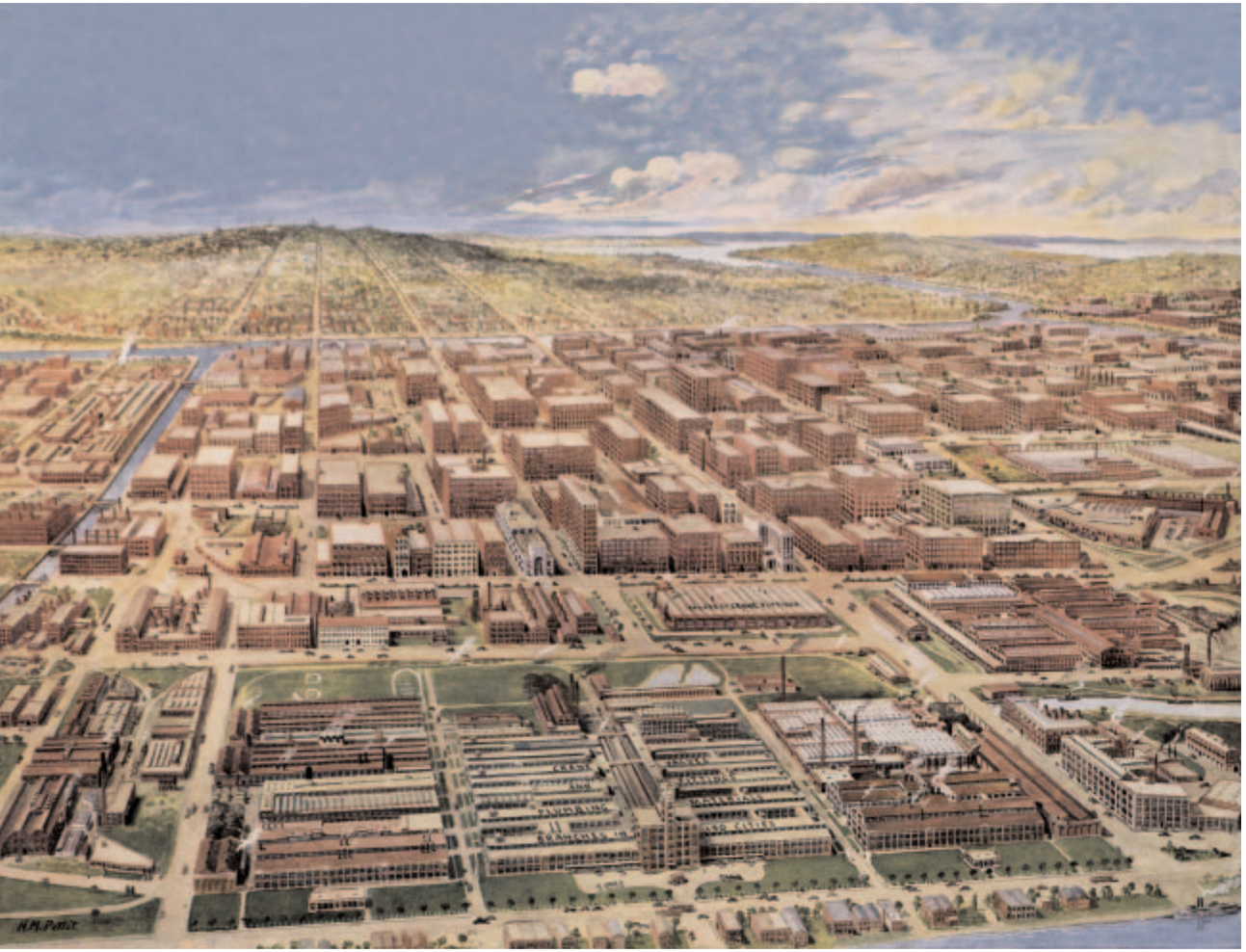
In 1925, Crane Co. established a separate plumbing engineering department, refined new technology to adapt assembly-line techniques to pottery making, and began to mass-produce its luxury line at an affordable price. China clay that was once pressed by hand into molds was now cast on a production line in a semifluid form that resembled molten metal. By 1928 the Company had launched its new line of color bathroom fixtures, with a quality along the same lines as those custom-made for nobility and the wealthy around the world. Not only did the Company create an extraordinary demand for its matching bathroom ensembles; it also succeeded in transforming the American bathroom into a symbol of the country's prosperity, a source of national pride—and in making Crane a highly respected household name.

Crane National Exhibit Rooms, Atlantic City

Views in the National Exhibit Rooms, Atlantic City

BUILDING THE BRAND: THE ATLANTIC CITY SHOWROOM

"You enter through an opened Crane gate valve, the largest in the Company's line," *Valve World* tantalized its readers with descriptions of the luxurious new Atlantic City Showroom completed by Crane Co. in 1926. "As you view its twenty feet of height and ponderous body, you are not surprised to learn that it weighs around 40 tons. The door is opened and closed by the raising and lowering of the massive disc, and this is done simply by touching a button which sets an electric motor in motion. The opening of the valve is seven feet in diameter." Once inside the massive gate, visitors gaped at giant marble columns that graced the foyer, inlaid mosaic floors, a solarium, and a roof garden. Exhibits ranged from the Company's full line of industrial valves to a representative sampling of the latest Crane plumbing fixtures—including a sunken marble bathtub. At a total cost of over $1 million, this was the flagship of Crane's four national exhibit showrooms, and did wonders to help build the Crane brand. It played an important role in Crane's distribution system, allowing the architect and his clients, the contractor and the homeowner, a wide variety of product from which to make selections for new construction or remodeling. Crane exhibit rooms like the one on the Atlantic City Boardwalk formed very important points of contact between the Company and the consuming public, especially since Crane did not retail its products at that time.



This illustration was commissioned to commemorate the seventy-fifth anniversary of Crane in 1930. It brings everyone (each company factory, shop, branch house, and sales office, plus the homes of over twenty thousand employees), from everywhere (196 cities across the United States and Europe), together in an imaginary "Crane Town." A medallion was also commissioned to commemorate the anniversary.

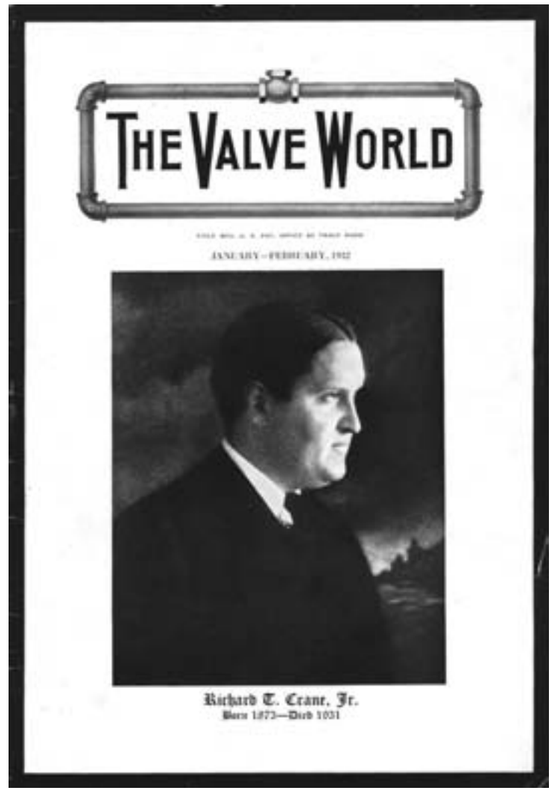
THE GREAT DEPRESSION STRIKES

The profits came roaring in. An unprecedented financial boom was fueling the explosive growth of the Company and the U.S. economy, and by the end of the decade Crane had expanded into almost every section of the earth where bathtubs were used. In 1920, there were 86 branches; by 1930 Crane had 190 with more than twenty thousand employees, and a surplus of some $20 million in buildings, machinery, inventories, and accounts receivable. However, the Company had very little cash to fuel further expansion plans, so R.T. Jr. took out a $12 million loan from the Continental Illinois Bank. "Looking back," said John Berryman, "it seems extraordinary that this transaction could have been handled at all." Banks were beginning to collapse all across the nation.

On Thursday, October 24, 1929, the first and most devastating of the October reckonings on Wall Street, the Great Depression settled in—grim and intractable. "Hoovervilles," shantytowns named after the president who insisted that "prosperity was just around the corner," sprang up in every major American city. Due to the interdependence of the world's economies, an estimated 30 million people lost their jobs around the globe. With the Great Depression dragging down the global economy, R.T. Crane, Jr., retrenched from his plans of expansion, and simply completed construction already under way.

As sales continued to slip and competition grew sharper, President Crane's closest advisers urged him to "take some canvas off the ship," but R.T. Crane, Jr., would have none of it. After all, 1930 was Crane Co.'s seventy-fifth jubilee anniversary, and he wanted it marked by good feeling. To celebrate, he entertained Crane Co. managers in his home on Lake Shore Drive in Chicago and hosted a picnic at Riverview Park that housed an amusement park the Company had leased for employees and their families (numbering some thirty-five thousand people). Every Crane branch and factory from coast to coast, from North to South, and across the seas, celebrated the Company's seventy-fifth anniversary with picnics, dances, and spirited athletic competitions.

But that celebration was short-lived. Like most other American businesses, Crane Co. was severely tested by the Great Depression. The Company reported its first operating loss in 1931, and late in October, R.T. Crane suddenly grew quite sick. According to the *New York Times*, his doctors reported he had been "ill for ten days of heart disease," which was aggravated "by concern for the welfare of Company employees, many of whom had been laid off or had their working time reduced as a result of business depression." H.T. Bishop, secretary of Crane Co., concurred: "The welfare of his employees was the great interest in Mr. Crane's life, and when conditions forced retrenchment it affected him deeply." R.T. Crane, Jr., passed away on November 7, his fifty-eighth birthday.



1928

IN AFFECTIONATE REGARD FOR
R. T. CRANE, JR.
3600 OLD EMPLOYEES
OF CRANE CO.
HAVE SET THESE GRIFFINS
TO GUARD HIS HOME ON CASTLE HILL

"No finer man ever headed a company," said John Berryman, who was elected the new president. "His integrity and honesty were so firmly fixed that he leaned backwards and he insisted that all transactions should be based on his own high standard." During his life he made gifts to employees of 366,000 shares of Crane Co. stock from his personal holdings, valued at more than $12,500,000, and when he died in 1931 left them another $1,020,000. "His heart was in the company" said Berryman, "and he was governed by a strong desire to make the company outstanding; to make it a household word.... He was not brought up the hard way like his father.... He would spend freely, sure that tomorrow would fill up the chest again. Perhaps he was not the best businessman in the world, but he was one of the finest men I ever met."

An eternal optimist, Richard Teller Crane, Jr., believed in Crane Co. and in the people who made it great. He was as progressive in developing the Company's mass-marketing program and leadership in sales as his father had been in developing mass production. While the death of R.T. Crane, Jr., marked the end of the family's leadership of the Company, the culture they established survived intact.

The pair of griffins, sculpted by artist Paul Manship, were given by the employees to R.T. Crane, Jr., and his family for their summer home in Ipswich, Massachusetts.

Above: John B. Berryman was named president upon the death of R.T. Crane, Jr.
Opposite: R.T. Jr's brother Charles delivered a tribute published in Valve World.

feature of his official life. As host to the Veterans and their guests—and especially when years of Company service qualified him for League membership—he gave and received the hand of cordial fellowship. His manner said more plainly than words could have done: "For this occasion, please forget that I am your President. Let me enjoy the privilege of being a fellow-worker and a Crane Veteran with you."

Characteristics

And when he addressed the League on these occasions, informally and always with deep feeling, the innermost character of the man was dominant. His innate love of honesty and fairness; his abhorrence of sham and trickery and unfair dealing came frankly to the fore as he referred to the Company's traditional policies and urged the Veteran employees to do all in their power, both by precept and example, to keep them characteristic of Crane business and Crane personnel.

He wished each employee to reflect the Company at all times and on every occasion—fair dealing with the Company's customers; fair dealing with the Company's employees; fair dealing with the Company's competitors. Let these Veterans, and every other employee of the Company, be constant and active evidence that they were part of a "corporation with a soul," a corporation infused with the

Tribute to the late President by his Eldest Brother
Charles R. Crane
A Former President of Crane Co.

When Mr. R. T. Crane, Jr., became President of the Company, he was perfectly clear in his vision as to what his life work was to be. All of his power was to be concentrated on the Crane Co. without any conflicting interests. He was to be diligent in business. His supreme ideal was his father, for whom he had almost a religious devotion to be expressed in carrying out everything he knew or could learn of the business traditions left by the Founder. Every product of the Crane Co. was to be carefully designed, suitable for the purpose for which it was intended, made of reliable material, manufactured by a loyal, competent Organization trained to the highest standards, a product carefully inspected and sent out to any part of the world with full confidence that it would speak well for Crane Co. The personal relations, both within the Company and toward the world with which the Company did business, were jealously kept at the highest possible standards. The warmest friends of Mr. R. T. Crane, Jr., were his Crane Co. Family, and it was always his chief concern to be the very best friend that any of them had. In an industrial country like America, he was a fine living example of the way an industrial leader, through the years, should meet the daily problems, small and great, constantly pressing on one called to carry so heavy a burden. His successors can have no higher duty than to try to understand what he and his father were trying to do and to live up to their high ideals.

pany's successful future. He wished every employee to share in this justifiable pride, this unfailing optimism; to conduct themselves at all times so that they might be proud to be known as "Crane Men," faithful in their work, loyal to themselves and to the Company, and an example of good citizenship to all of their fellows.

And he would present the League medals to the new members with a warm handclasp, a smile and a cheerful word for each. From long observation and close association, this writer ventures to say that Mr. Crane had few higher or happier moments in his business life than these intimate and friendly contacts with the Company's Veteran employees. And, in a measure, this pleasure was his whenever he went through the Company's shops and Branches, cordially greeting every one he met.

In all such contacts there was no gesture of the "patron" about Mr. Crane. He greeted every one, no matter what his position, frankly and simply as man to man. He wished every one connected with the Company to be contented and happy, and he spent his days and his substance in doing what he could to bring about this condition.

Gifts to Employees

Outright gifts of Crane stock—from his per-

ARMY-NAVY E AWARD CEREMONY AT CRANE CO. IN CHICAGO, FEBRUARY 4, 1943.

Hedrich-Blessing photograph collection—Crane Co. series, Chicago Historical Society.

CHAPTER THREE

Valves for Victory

WHEN JOHN BRONDGEEST BERRYMAN took charge of Crane Co. in 1931 at the height of the Great Depression, U.S. unemployment had skyrocketed to 24 percent. Wages were falling in a seemingly endless tailspin, plummeting by 60 percent between 1929 and 1932. The entire banking system was in dire straits, and businesses were failing at breakneck speed. During the miserable winter of 1932–1933, the residential building market, from a peak of nearly $3.3 billion in 1928, dropped to $250 million. Dependent almost entirely on new housing, Crane Co. plumbing sales practically vanished. The foundries were barely operating, supported by only a few projects for the U.S. government, such as Boulder Dam. "A trip through the Chicago Works in those bleak days was a depressing experience," Berryman recalled.

Above: Crane Co. installation at Norfolk Dam (Arkansas). Hedrich-Blessing photograph collection—Crane Co. series, Chicago Historical Society.

Above: Century of Progress exhibit, World's Fair, Chicago, 1933–1935. Below: Crane supplied all the railing materials for the Golden Gate Bridge, opened in 1937.

"The flow of material through the shops had fallen from a river to a trickle and in the acres of idle space, the black machines stood silent and waiting." For the first time in its history, Crane Co. was losing about $1 million per month. "That leak had to be plugged," said Berryman, "or we were sunk."

RIDING OUT THE STORM

Under the leadership of R.T. Crane, Jr., the Company had expanded throughout the United States and Canada and made inroads into England and France. Plants had been purchased for enamelware and pottery, and the capacity of the Chicago Works had been substantially expanded, all of which had dramatically increased overhead. Berryman therefore set out to lower the Company's operating expenses, reducing them by more than $13 million over the next two years and another $33 million in 1933. He accomplished this by shutting down the Bridgeport plant and operating the Chicago Works just two days per week, reducing the number of branch houses from 156 to 134, cutting salaries, reducing personnel and working time, and slashing inventory from $35 million in 1929 to $18 million by 1933.

As it was for so many other businesses around the world, this was the most severe challenge in the Company's history. Although five of the nine directors on the board were either members of the vast Crane dynasty or their representatives, this was the first time that the Company had to face a crisis of such unprecedented magnitude without the leadership of a Crane man at the top. But John Berryman was ready for the challenge. Born in Toronto in 1862, Berryman had joined Crane Co. in 1892 as manager of the Minneapolis branch office and became head of the Engineering Department in Chicago three years later. Before long, R.T. Crane made him general manager of the Company. In 1905 he was elected to the board of directors, and then worked his way up from assistant secretary to first vice president in charge of operations under R.T. Crane, Jr.

RECOVERY

With four decades of operating experience behind him, Berryman did indeed help Crane weather the storm. Throughout the depression, he had managed to keep the Company's cash and securities intact, and like other well-financed and efficient American corporations, Crane Co. rode out the worst effects of the downturn and began to return to profitability by 1934. Residential building (which translated into new plumbing and heating contracts for Crane) started a slow revival, spurred by federal loan guarantees. Crane Co. turned a profit of just over $1 million in 1934, and the following year declared a $1 dividend on preferred stock—the first payment in three years. In 1935 Americans spent some $480 million on residential construction, twice the amount of the previous year. Factory building and reconstruction began to pick up markedly, and Crane factories were humming full-time once again. "Crane Co.'s own aged and inadequate headquarters in Chicago," reported *Fortune* magazine in 1936, "are shining at the moment with a happy light of expectancy."

Berryman attributed Crane Co.'s success in surviving the devastating economic downturn to a dedication to quality that dated back to R.T. Crane. "In this," said Berryman, "we do not take our hats off to anybody." Crane Co. had no monopoly on the U.S. valve business and no basic patents, *Time* reported in 1935. "Its dominant position is based on its ancient reputation for quality." Equally vital, Berryman believed, was the Company's fundamental commitment to customer satisfaction:

> *He [the customer] is our No. 1 man—the most important factor we have to deal with.... We have established a reputation for square dealing, in so far as we have delivered to him honest merchandise at a price fair to him and ourselves. He comes back again and again. He is the outward symbol of that intangible, but enormously valuable thing, called 'Good will,' which we possess in greater measure than our competitors. In business the cultivation and retention of good will is the keystone of success.*

A CITY WITHIN A CITY

They say that if it only had a church and a hotel, you could spend a lifetime in New York City's Rockefeller Center. From more than two hundred stores to dozens of dentist's offices, from the seventy-floor General Electric/NBC building to myriad corporate headquarters that form a cross section of the business, communication, cultural, and industrial worlds—it's all in the Center. The valves and fittings and a majority of the plumbing fixtures in this "City Within a City" are Crane products. Most of the pipe, cut to length, was furnished by the New York Crane branch from 1931 to 1939. As in countless other buildings, Crane products contribute to the efficiency and beauty of these landmark skyscrapers.

DESIGN FOR LIVING

"When industrial designers tried to introduce their new designs into the sacred American living room, they were rebuffed at the front door. But they persisted and finally gained entrance through the back door. Their first achievements were in the kitchen, the bathroom and the laundry, where utility transcended tradition."
Henry Dreyfuss, *Designing for People*, 1955

Crane Co. and Henry Dreyfuss, America's premier industrial designer, were formidable partners in creating the American bathroom, kitchen, and laundry room we take for granted today. Dreyfuss designed all Crane's fixtures, and America loved them. Elegant Crane showrooms were located on "Main Street" in cities large and small.

With the Company safely through the depression, seventy-three-year-old Berryman relinquished the presidency in 1935 and became chairman of the board, a position he held through World War II. This was not an unexpected move. When the directors had elected him president in 1931, it was a "stop gap" measure, he explained. "I was considered too old to carry the load for any great length of time." He left the presidency with a well-developed plan for succession securely in place.

Berryman made way for Charles Beach Nolte, a forty-nine-year-old engineer and, for the first time in the Company's history, a leader who was something of an outsider. The estate of R.T. Crane, Jr., had brought Nolte onto the board of directors in 1932 "to size up the company's position," according to *Fortune*, and "to watch the business in action, make suggestions, report his opinions quietly to the estate." After all, the heirs of R.T. Crane, Jr.'s, estate held about 65 percent of the Company's outstanding stock at that time. Nolte had been on the board only three years when the directors elected him president in 1935. Following his graduation from the University of Illinois in 1909, he had joined Chicago's Robert W. Hunt Company, one of the largest firms of consulting, testing, and inspecting engineers in the United States. Since 1930 he had served as president and general manager of Hunt. According to one colleague, Nolte was a man "of abounding energy and a brilliant mind. Without any experience in our line of work, he grasped the essential features within a short time and settled down to carry on successfully the conduct of the business."

Charles Nolte led Crane through a prosperous period of recovery when the Company's best markets were the oil and gas industries. More and more oil wells were being drilled, pipelines laid, and refineries built, all calling for innumerable valves and fittings. Perhaps no other job Crane Co. tackled in the 1930s could compare with the spectacular Iraq pipeline that carried oil twelve hundred miles across the Syrian desert from Kirkuk to Tripoli to Haifa, and through the mighty Tigris and Euphrates rivers. Crane supplied more than 1,000 tons of fabricated pipe and flanges for the line, and more than 265 tons of high-pressure steel valves, made in Chicago and shipped to Syria.

Charles Beach Nolte

AN EYE FOR DESIGN

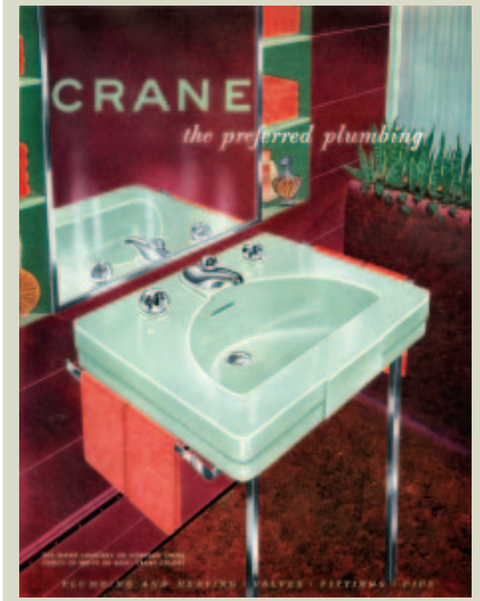
With recovery under way, Nolte began to gear up production of Crane Co.'s world-famous line of bathroom, kitchen, and laundry fixtures. In 1935 he contacted the famous American industrial designer Henry Dreyfuss and hired him to design a bold new line of Crane plumbing fixtures. These sleek, ultra-modern designs brought the Company—and Dreyfuss—widespread recognition. But after Hitler's armies invaded Poland on September 1, 1939, igniting World War II, the metals used to create this line were critical for the war effort, so Crane Co. had to suspend production.

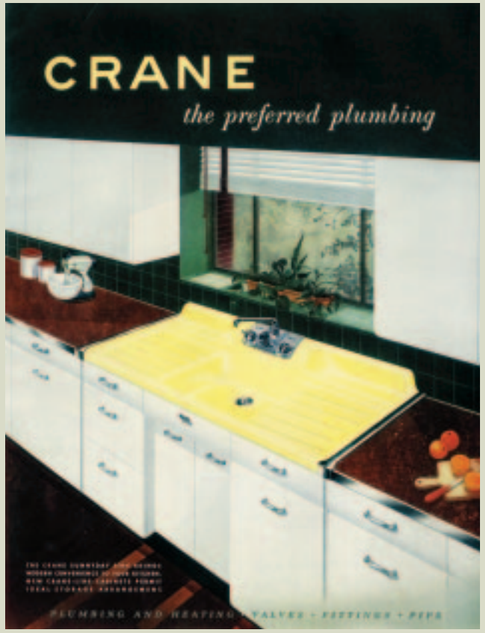
In his 1955 autobiography, *Designing for People*, Dreyfuss described how the president of Crane Co. informed him that he wanted to cancel their agreement for the duration of the war, but "he added that he wanted to pay an honorarium so that we wouldn't work for anyone else in his field. I told him that because of existing conditions he didn't have to pay us and we wouldn't work for anyone else. He insisted and left a check." Three months later President Nolte went back to Dreyfuss and told him he'd changed his mind about canceling the agreement:

"I want you to keep us up to date," he [Nolte] said. "I want you to be thinking of what we are going to make when the war is over." He made available an entire floor of their building in Chicago, and we studied the Crane plumbing line, item by item. Together, we selected what should remain in the catalogue. Then we went to work designing new equipment to fill in the blank spaces. Metal was unobtainable except on priority, so full-size wooden models were built and enameled to simulate the actual porcelain. By the end of hostilities, Crane's postwar line of products was in readiness for manufacture. Thanks to the company's foresight, it gained a substantial time advantage in the market.

This was not the first time Crane Co. found receptive markets with such foresight, and it wouldn't be the last. Nolte is also credited with refinancing Crane Co. during this era and putting it on a more solid foundation than the one R.T. Jr. had laid. Sales were steadily increasing, and Crane's shares were listed on the New York Stock Exchange in 1936. Nolte also expanded the research division in 1937, and by the close of 1938, some sixteen thousand employees were producing more than forty thousand different products at eleven manufacturing facilities in the United States, Canada, England, and France.

This advertisement, and those shown on the following page, feature Crane plumbing fixtures designed by Henry Dreyfuss.





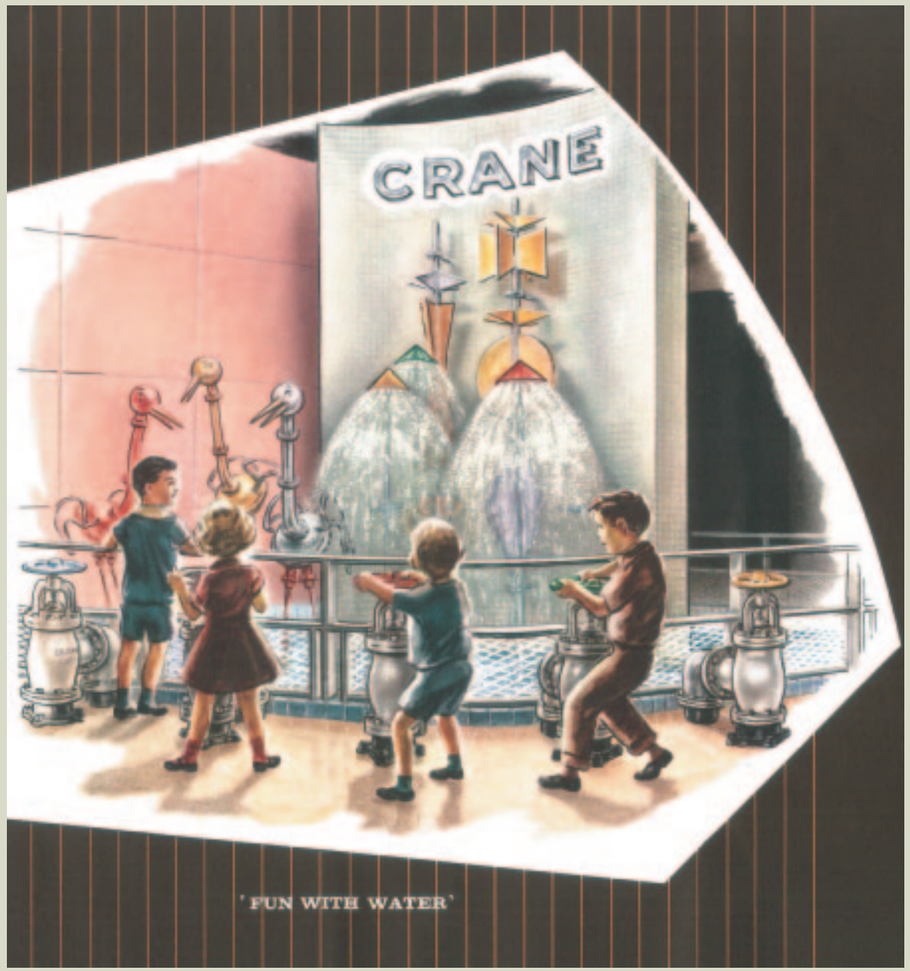
Above: You could take your pick of fragrance—seashore or northern woods—and any temperature or level of humidity you wished, on the "House of the Future" Crane Climate Center panel. Even outdoor temperature and forecasts could be quickly determined.

Below: A valve-turning ceremony opened the Crane "Tomorrowland" exhibit. From left to right: Henry Dreyfuss, designer of Crane plumbing fixtures and the exhibit's "Bathroom of Tomorrow," Frank F. Elliott, president of Crane Co., and Walt Disney.

CRANE IN DISNEYLAND

In 1954, Monsanto started its "House of the Future" (pictured above) by asking the Architecture Department of the Massachusetts Institute of Technology to design a plastic house imagined for about 1975, to be built at Disneyland. Monsanto invited Crane to participate in the electronic kitchen and bathrooms, where the fixtures were fabricated as part of the walls and floor. The wave of a hand before an electronic eye turned water on and off. Sinks adjusted to child and adult heights with the push of a button, and toiletries were dispensed automatically. In 1956, another project, "Tomorrowland" (shown left and on the following spread), opened at Disneyland—with an inventive, interactive exhibit about the flow of fluids, designed by Dreyfuss and built by Crane Co.

CRANE
in Disneyland



Pages from the brochure produced for the Crane "Tomorrowland" exhibit. From the collection of Lee Olson.

Specifications for "Tomorrow's Bathroom"

COLOR OF ALL FIXTURES—
CRANE CITRUS YELLOW

J, 5'6", made
t iron. Bath is
effect. Trim is
and No. 9-66
d overflow in
te. (Regularly
ome plate.)

80, 30¼x22",
n, made of
8-1 Criterion
waste fitting
plate.

with Moltex
flat top tele-
etal is satin

d) Hygiene Bidet, No. 3-267 (bathroom ac-
etter personal
reous china.
with vacuum
d rose spray
late.

. 2-360 Cri-
hower supply
mple shower
gold plate.

ure with satin
me.

older in satin

or all hidden

i) Crane Type "R" Sunnybase Radiant Heating along bath soffit.

j) Crane Year 'Round Air Conditioning.

k) Crane Type "RC" Sunnybase in closet section.

JOINING THE FIGHT

But Charles Nolte's tenure at Crane Co. was unexpectedly cut short with his death on April 29, 1941. "It is regrettable that a splendid fellow like Charlie Nolte, through a surplus of energy, had to burn out at a comparatively early age," said the chairman, John Berryman. "He was a good man for Crane Co." Shortly thereafter John H. Collier was elected president. Collier had originally joined Crane Co. during his college vacation, to earn extra money. The founder, R.T. Crane, had personally hired him, hoping to save him from "wasting his time" at Purdue University. "We can teach you more here in one year than a college can in a lifetime," Crane had told him. He intentionally dropped him in a very tough position to see whether he could stand the heat. He passed that trial and quickly moved up the ranks of the Company to run the manufacturing operations in England and France before returning to America. His selection by Crane proved to be a solid one not only because of his integrity, even temperament, and good judgment, but also because he was a trained production man. And gearing up for wartime manufacturing would prove to be a formidable challenge for American industry.

ANCHORS AWEIGH

As it had done in previous wars, Crane Co. embraced the nation's military effort, ramping up production to meet the demands of its primary customer—the U.S. Navy. During the 1930s, both military and merchant fleets had suffered from attrition, and the pace of shipbuilding accelerated as the specter of war loomed. After the destruction of 19 navy warships, and some 188 aircraft and the loss of more than 2,300 American lives in Pearl Harbor on December 7, 1941, the United States entered World War II and the shipbuilding industry skyrocketed. Because of the complex piping systems found in fighting ships and merchant ships alike, the Navy became the largest user of valves and fittings in the nation. Depending upon its size, each ship required between fifteen hundred and fifteen thousand valves. Because these vessels required self-contained power plants with heat and pressure requirements like those of commercial plants, valves and fittings Crane Co. had formerly custom-designed were now being mass-produced on a formidable scale in its factories.

John H. Collier

Crane employees with war bonds, August 3, 1942. Hedrich-Blessing photograph collection—Crane Co. series, Chicago Hisorical Society.

Production workers at Crane Co. plant, February 8, 1943. Hedrich-Blessing photograph collection—Crane Co. series, Chicago Hisorical Society.

By 1943, the U.S. shipbuilding industry was consuming about 20 percent of the nation's steel output—far more than any other industry. Before the war, Crane Co. was producing six thousand tons of steel valves per year; by the middle of 1942, that tonnage climbed to twenty-five thousand annually. Crane achieved this rapid increase in production through the introduction of new efficiencies in production at existing plants, as well as through the ingenuity of its engineers.

World War II also spurred innovation in American industry—and at Crane Co.—as never before. During the war, Crane engineers stepped up research in metallurgy and developed new steel alloys of various chromium, nickel, and molybdenum components to meet the corrosion-resistance requirements and the high standards of temperature structural stability necessary for defense plant projects. Following Japan's capture of Malaysia, which had cut off rubber supply routes, Crane Co. came through with new heat- and corrosion-resistant alloy steel valves for the synthetic rubber industry. The Company's laboratories pioneered the use of radiographic equipment to guide the development of improved casting techniques and better welding methods and for testing castings and welds of finished products. Crane's new catalytic cracking methods supplied the enormous quantities of high-octane fuel that aircraft now required.

During the Civil War, Crane had supplied thousands of brass parts for saddles, and in World War I, enormous quantities of valves, fittings, and trench mortars. Now, as people around the world celebrated the end of World War II, the men and women of Crane Co. once again took great pride in the extraordinary role they had played in equipping the American military for battle. For its excellent record in wartime manufacturing, Crane Co. received four prestigious Army-Navy "E" awards and a Maritime "M" award.

During World War II, one critical steel valve order from the United States Navy required double the capacity Crane was equipped to provide. Obtaining the extra volume of material meant conversion of a large gray iron foundry into a modern steel foundry. There was just one problem: an electric furnace was required, and due to materials shortages triggered by the war, not even a secondhand furnace could be found on the market. Crane's engineers took to the road, scouring junkyards and secondhand equipment stocks. Some parts were resized; others were reconditioned; missing pieces were custom-made. The rebuilt electric furnace went online in time to meet the production deadline for the navy. Such ingenuity and dogged determination, paired with a steadfast commitment to meet the needs of the U.S. government on tight deadlines, garnered Crane Co. four Army-Navy "E" awards for excellence in wartime manufacturing.

Because Crane's reputation for outstanding quality and competency had earned the Company many contracts in support of the defense industry in past generations, when the U.S. Army began to coordinate nuclear weapons research in 1952, the military called on Crane Co. to develop new types of valves for the top secret Manhattan Project. The Company supplied uniquely designed valves for the Oak Ridge, Tennessee, project, as well as for the atomic reactor plant of the U.S. Navy's *Nautilus*—the world's first nuclear submarine. From test-model specifications to final installations, Crane Co. engineers also provided valves and fittings for the first nuclear merchantman, the NS *Savannah*, and the first nuclear aircraft carrier, the USS *Enterprise*. Developing valves that operated by remote control in radioactive material proved to be a tough but not insurmountable challenge for Crane engineers. After the war, Crane Co. maintained its leadership position with military applications and also supplied private industry with many special valves for the first nuclear-powered electric generating stations.

Atomic energy display at Crane Co. in Chicago, July 25, 1956. Chicago Historical Society.

The world's first nuclear submarine, USS Nautilus, *in New York harbor.*

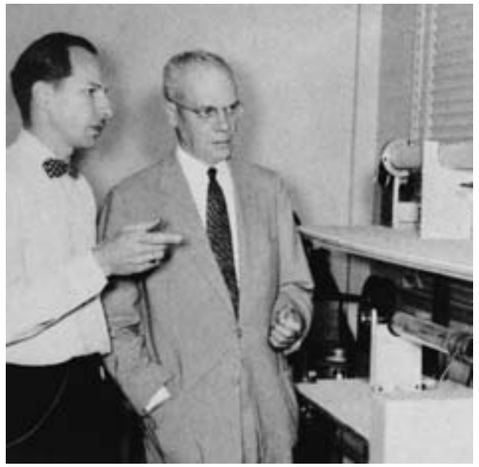
THE NEW WONDER METAL

When Canadian-born John L. Holloway was elected president of Crane in 1946, the Company had developed its valve and fitting business to such an extent that it was well established in nearly every major industry, even in the more modern ones such as the chemical and food-processing industries. Hardly a dam was built, oil refinery constructed, railroad run, hospital heated, or battleship launched without using one or more of the some thirty thousand products manufactured by Crane Co. Only one major industry remained elusive: aviation. Air transport had made tremendous strides during the war, and commercial aviation had "taken off" as well. The Second World War had elevated the importance of air transport, and in the booming postwar era, the federal government began to oversee the rapid development of a modern system of civilian air passenger transportation. Always at the forefront of advances in industry that could provide profitable new niche markets, Crane Co. was ready to seize an exciting opportunity.

When John Holloway learned that jet plane designers were expressing new interest in the properties of titanium, a metal nearly as light as aluminum but six times stronger, his curiosity was aroused. Jets promised to fly faster and higher with this metallic element because of its high strength-to-weight ratio and higher melting point than aluminum. Crane Co.'s research engineers and metallurgists had been studying titanium and foresaw that if it ever became commercially available to aviation, it would no doubt be used for valves and fittings in a variety of other industries as well. Its high resistance to corrosion, particularly in salt water, was just one reason.

From the moment Holloway learned about the special properties of titanium, he began to think it might prove to be an ideal material to create new alloys for industrial valves and fittings. He and his engineers envisioned new applications for titanium in valves for the marine, chemical, and oil industries, as well as aviation. From Excelloy to Nitralloy, Crane Co. had been at the forefront of the development of new alloys to serve fluid-handling needs since its very inception.

Determined to maintain that leadership in industrial metallurgy, President Holloway made the decision to produce titanium on an experimental scale. In 1951, pilot plant production at the Chicago Works got under way. In short order, Holloway formed Cramet, Inc., to build and operate a titanium-producing plant in Chattanooga, Tennessee, and formed Marine Minerals, Inc., to mine the ore in creek beds in property acquired by Crane Co. near Aiken, South Carolina. While Crane had always pioneered with its own alloys to meet the evolving demands of a variety of industries, this was the first time quality was controlled by starting at the mine. In 1953 the Company won a contract from the Defense Materials Procurement Agency (DMPA) that made it the largest single producer of titanium in the United States—topping its chief rivals, DuPont and Titanium Metals Corp. of America. The DMPA advanced the Company nearly $25 million to build the titanium plant in Chattanooga, and Crane Co.'s first titanium valves reached the market in 1954.



John L. Holloway (right) inspecting a zone leveling furnace used in refining the metal germonium.

Titaniun display from the Crane "Tomorrowland" exhibit.

Out of the "Wild Blue Yonder"—Down to Where the Rubber Meets the Road... that was the story when Hytrol, the antiskid braking system pioneered in 1948 for safety and economy in the aviation industry, was introduced a decade later to play an equally important role in trucking.

HEAD IN THE CLOUDS...FEET ON THE GROUND

The booming aviation industry also required superior engineering to control the flow of fuel, the superheating of gases, and the circulation of warm and cool air throughout aircraft cabins at high altitudes. But because Crane Co. engineers had very limited experience in aviation, John Holloway believed that the Company needed to acquire a first-rate outfit that did. The most promising prospect: Hydro-Aire, Inc., a Burbank, California, company that had its "head in the clouds" and "feet on the ground," according to its advertisements. Originally organized in 1943 by Homer H. Rhoads in his garage in Beverly Hills, California, Hydro-Aire started out by producing soldering irons and electric wall heaters. As World War II stimulated unprecedented demand for innovative technology for military aircraft, Rhoads moved his twelve employees to Los Angeles and began designing, developing, manufacturing, and marketing hydraulic cylinders and check valves, and fuel check and selector valves. Other products included fuel filters, fractional and integral horsepower electric motors, fuel gate valves, hot air valves, and a large variety of pneumatic, hydraulic, and mechanical control devices.

A widely recognized manufacturer of highly developed precision products for aircraft, Hydro-Aire held a preferred position as a supplier of filters and valves to all manufacturers of turbine aircraft engines, and jet manufacturers also relied on its valves to control rocket propellant fuels. Hydro-Aire also manufactured an antiskid braking system to allow supersonic planes to land safely at record-breaking speeds. In 1948, Boeing partnered with Hydro-Aire to design, produce, and market the Hytrol Mark I antiskid brake control system, which became part of the B-47 military plane. That pioneering design was followed in rapid succession by antiskid braking systems for the B-52 in 1952, and the F-100, C-130, and RF-84F in 1954, and in 1956 two more military aircraft were added to the Mark I list, as well as Boeing's 707-100—the first commercial jetliner.

Boeing
B-47 Jet Bomber
1946

Lockheed
F-104A Starfighter
1957

THE RIGHT STUFF

Hydro-Aire's development of two innovations critical to aviation as we know it today evolved from solutions for supersonic flight and large jet-powered aircraft. Special fuel pumps prevented the boiling of jet fuel due to changing pressures at high altitudes, or "vapor-lock" on aircraft such as the supersonic F-104A Starfighter. Without a solution to this problem, the maximum speed of planes would have been far less than the speed of sound. In 1946, Hydro-Aire engineers teamed with Boeing to safely stop the B-47, the first jet-powered bomber, with its immense speed and weight, on runways of typical length. In 1949, Hydro-Aire designed, tested, produced, and marketed the system that eventually became the industry standard. A majority of aircraft today rely on Hydro-Aire brake controls for safe, efficient, dependable stopping in all weather conditions.

Following World War II, the U.S. Air Force turned to Hydro-Aire to develop its accessory design program for its aircraft and engines. By 1951, total annual sales had reached $5 million, and the operation had moved its employees (314 in production and 141 engineers) to a twenty-five-thousand-square-foot facility in Burbank, California. They found themselves in the enviable position of experiencing a rapid increase in demand for their products. In response, they stepped up research and engineering as well as production operations. They were actively searching for investment capital for expansion when Crane Co. knocked at their door.

With the control of flow in the aviation industry a logical next step, the Company purchased Hydro-Aire in 1951. Although it was just a small organization at that time, one or more of its products was being used on every transport plane or military aircraft then being made, and its "flying gas stations" could control the delivery of up to six hundred gallons per minute to planes in flight. Hydro-Aire had also pioneered the development of a new type of aircraft fuel pump that helped prevent "vapor lock," removing a previously insurmountable obstacle to flying speeds approaching, let alone breaking, the sound barrier. With the advent of the transistor, Hydro-Aire's engineers broke new ground using this new technology for a variety of electronic applications, from aviation to the burgeoning television industry. As the transistor began to replace many types of radio tubes in controlling the flow of electrons, Hydro-Aire responded with a new type of valve to meet industry's demands.

In less than two years after joining the Crane family of companies, Hydro-Aire doubled its sales volume to $11 million and significantly expanded its research and manufacturing capacity. Before long, the firm established an electronics division to manufacture and market semiconductor devices in its growing San Fernando Valley plant.

TROUBLE ON THE HORIZON

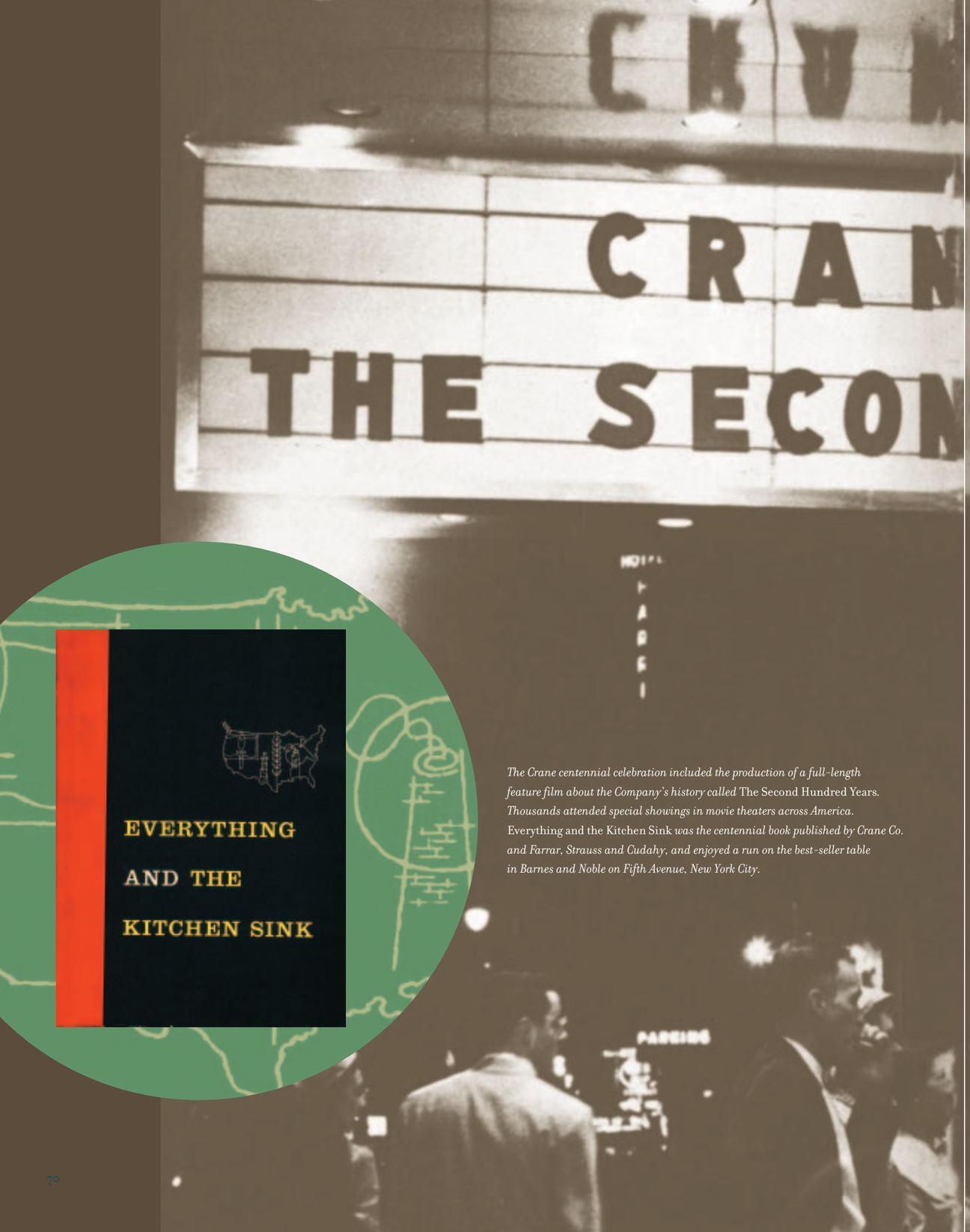
By the mid-1950s, Holloway had led Crane Co. through a $45 million expansion program. From diffusion valves for nuclear facilities and titanium production to air-conditioning and radiant heaters, together with the important acquisition of Hydro-Aire, Holloway had steered Crane into dynamic new areas of technological innovation. And he was banking on the new wonder metal, titanium, as his long-range bet to fuel expansion throughout the rest of the decade. The Company seemed poised to continue to capitalize on America's prosperity during the 1950s and sustain that momentum in the rapidly changing postwar economy. The world was its oyster—or so it seemed.

On the surface, Crane Co.'s house appeared to be in order, but trouble was looming on the horizon for American industry. Across the country labor rates were rising steadily as organized labor was reaching the pinnacle of its power. To compensate, most large companies were raising prices. And while it had been a glorious decade for much of American business, Europe and Japan had been steadfastly rebuilding their war-torn economies. The threat of overseas competition was growing more palpable.

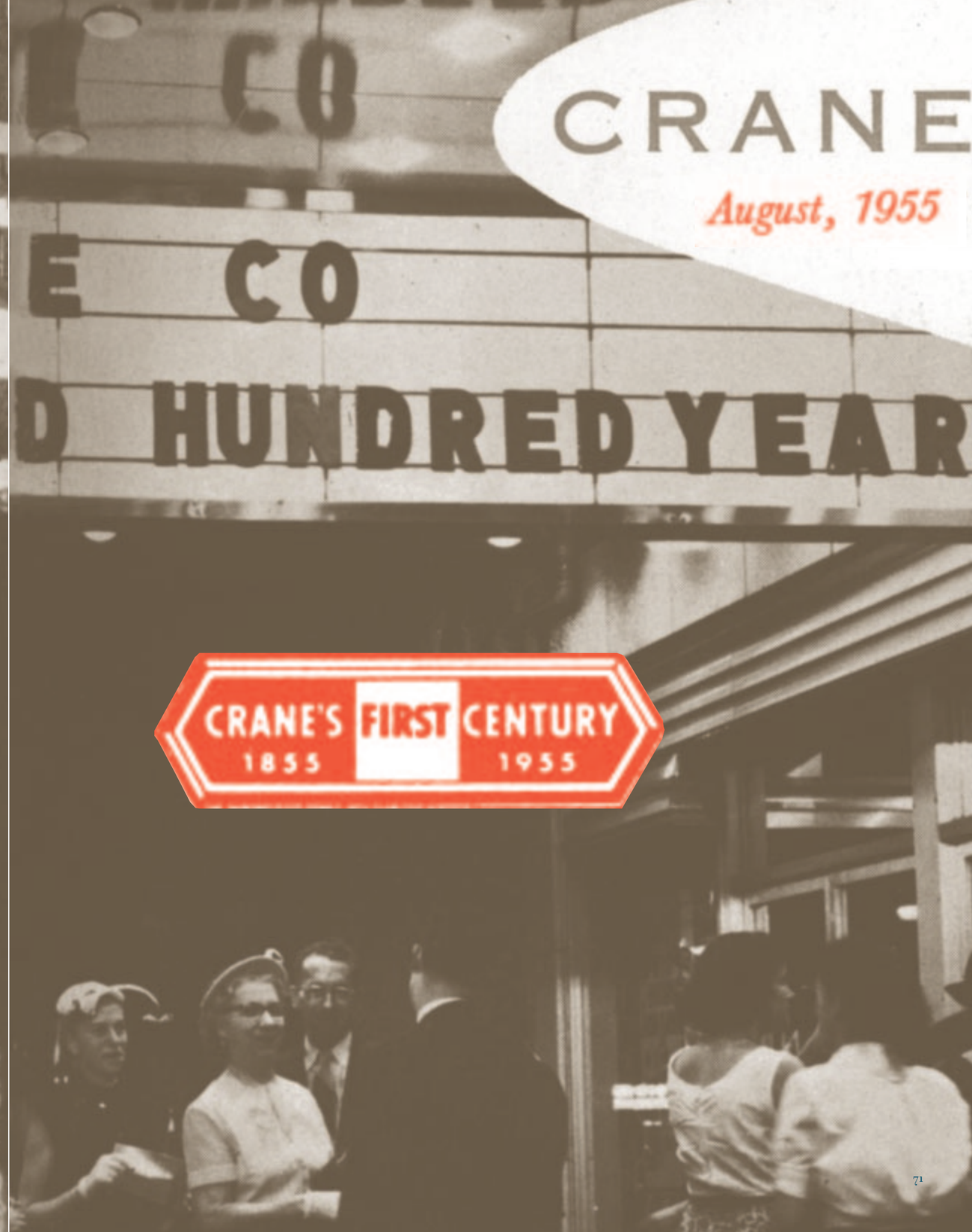
Stock market speculation was reaching dangerously high levels, and shareholders were beginning to voice their concerns about lackluster performance. In 1954 a proxy battle for control of the venerable but ailing New York Central Railroad captured the full attention of mainstream America, and was yet another harbinger of things to come.

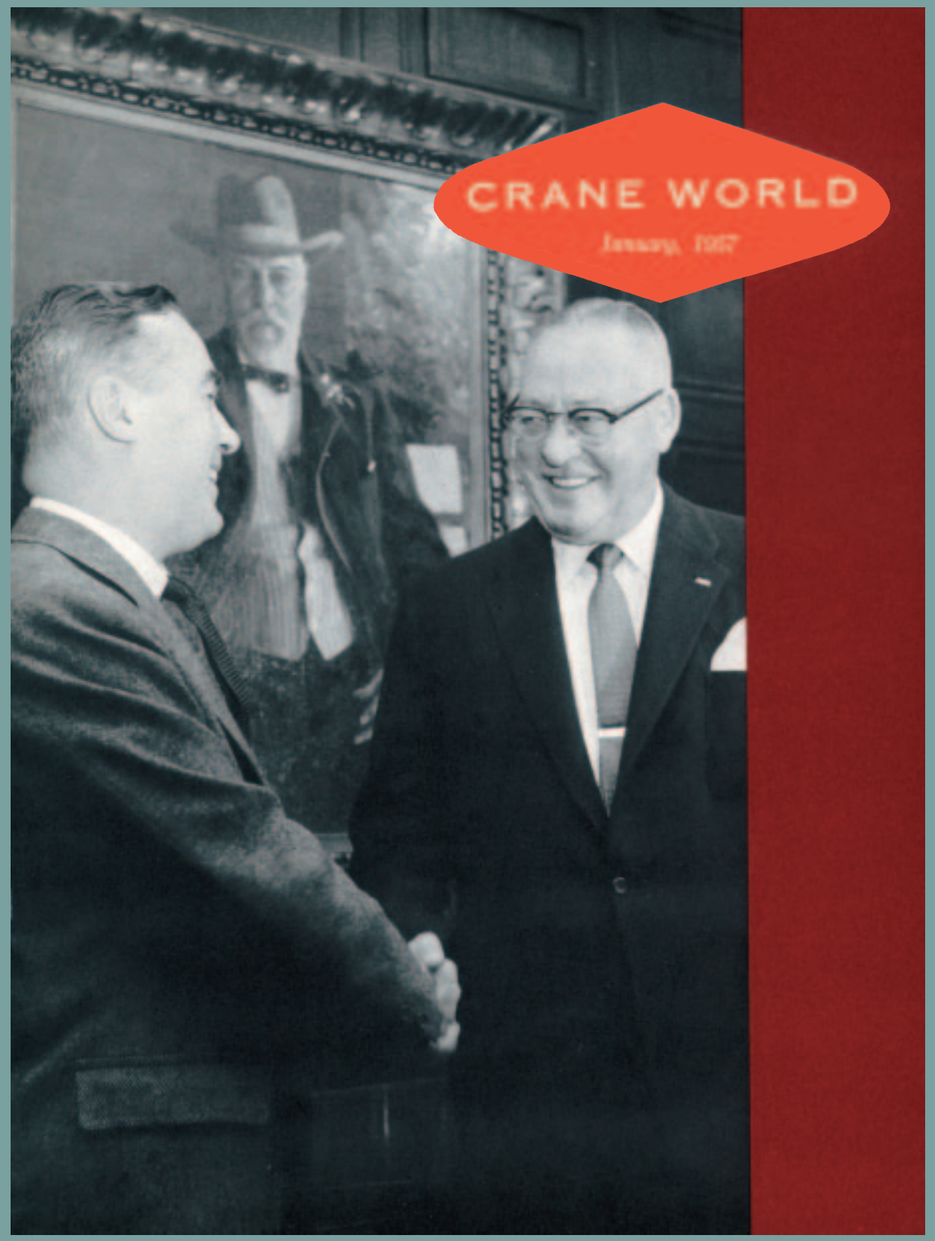
Throughout the decade, Crane Co.'s sales had been highly erratic, declining steadily after 1956. Even more problematic, profit margins had tumbled to less than 3 percent and many branches were not operating profitably. A four-and-a-half-month strike at Trenton Potteries Division had a detrimental effect on plumbing sales. Following four other strikes in Company branches, Crane Co. reached agreement with labor on a total of thirty-four union contracts. Although John Holloway had bet the Company's future on titanium, anticipated government demand for the metal never materialized, and the principal markets for titanium sponge dried up. Crane Co. was clearly in need of a decisive plan for revitalization and the strong leadership to make it happen.

Crane Co. kitchen, bathroom, and heating display at the Home Show, April 12, 1957.
Hedrich-Blessing photograph collection—Olson designers series, Chicago Hisorical Society.



The Crane centennial celebration included the production of a full-length feature film about the Company's history called The Second Hundred Years. *Thousands attended special showings in movie theaters across America.* Everything and the Kitchen Sink *was the centennial book published by Crane Co. and Farrar, Strauss and Cudahy, and enjoyed a run on the best-seller table in Barnes and Noble on Fifth Avenue, New York City.*





NEW PRESIDENT NEELE STEARNS (LEFT) WELCOMED BY FRANK ELLIOTT.

CRANE WORLD COVER, JANUARY 1957

CHAPTER FOUR

The Winds of Change

THE NEED FOR NEW LEADERSHIP became critical on May 15, 1956, when a small Company plane crashed into a field three miles outside Louisville, Kentucky, killing six top Crane Co. sales executives en route to a national meeting. The tragedy stunned the board into the realization that a stronger succession plan needed to be developed quickly. John Holloway had resigned the year before, and Frank Elliott had stepped in temporarily as president until the board could find the right leader to put the Company back on track.

In November, the board pinned their hopes on forty-nine-year-old Neele E. Stearns—the first professional manager the board had ever elected president. A quiet and methodical man trained in modern business methods, Stearns was formerly vice president of planning and development at Inland Steel, where he had worked since 1940. With the era of family leadership of

Neele E. Stearns

many old-line firms waning, a new generation of leaders like Stearns was emerging from the nation's business schools, skilled at developing operational strategies in tune with the rapidly changing postwar economy.

When Stearns officially came on board in the beginning of 1957, he began to develop a plan to help the Company return to profitability throughout all its divisions. But toward the end of the summer, the U.S. economy entered the third postwar recession—the most severe readjustment to date. Like other organizations, Crane Co. was hit hard with rapidly increasing operating costs and shrinking markets. Between August 1957 and April 1958, U.S. industrial production slipped 13 percent while unemployment jumped to nearly 8 percent. Crane's major businesses were strapped to the back of the economy, and when construction slumped, the Company suffered. Intense competition and general inventory reduction by customers further intensified losses.

T.M. EVANS MAKES HIS MOVE

One shrewd investor, in particular, was watching these developments with keen interest. Always on the lookout for undervalued companies to acquire, Thomas Mellon Evans came across a report of shares trading for less than the business's net worth: Crane Co. of Chicago, the nation's largest manufacturer of valves, fittings, and fabricated piping. During this period, Crane was making some forty thousand different products, controlling fluids throughout nearly every major industry, including the booming fields of aviation and nuclear power generation. Well regarded by the public for its elegant bathroom fixtures, the name Crane Co. was synonymous with quality, and its vibrant, colorful ads graced the pages of the nation's glossiest home-decorating magazines.

But the venerable old business had earnings in the range of only 2 to 3 percent, which had depressed the stock to a point that it was selling at around $30 per share—well below the book value of $70. To some investors, that was not the right way to run a business. After all, a company had a responsibility to its shareholders.

To Evans, Crane Co.'s stock was a real value and too good to pass up. In September 1957, Evans instructed his trading desk to begin accumulating shares of Crane. As the recession wore on, a nervous market drove the stock lower. Companies were making draconian cuts as the winter approached and the economy continued to falter. With nearly 5 million people out of work, America was witnessing the steepest drop in employment since the war.

As chairman of Pittsburgh's H.K. Porter Co., Inc., an industrial conglomerate with assets of $57 million, T.M. Evans specialized in collecting and modernizing old, family-owned businesses that had fallen on hard times. A native of Pittsburgh, he had worked his way up from humble beginnings. After studying economics at Yale and graduating in 1931, he landed a $100-a-month job as a clerk in the chairman's office at Gulf Oil, then owned by the Mellon family, to whom he was distantly related (his grandmother's first cousin was the famous banker Andrew Mellon).

William L. Mellon, then head of Gulf, served as his mentor and encouraged the young Evans to try to strike out on his own—a formidable undertaking during the Great Depression. Embracing the challenge, Evans started out by purchasing Gulf stock on borrowed money and was able to participate fully in the market recovery of 1936–1937. At the age of twenty-eight, he parlayed his profits into the purchase of defaulted bonds of the H.K. Porter Co., a Pittsburgh locomotive manufacturer that had been hemorrhaging money. The company eventually filed for bankruptcy in 1939; in the reorganization, his holdings proved sufficient to earn him the presidency. Evans then turned that firm around by diversifying into steel, construction materials, and hardware, and building it up into a highly profitable conglomerate.

When he set his sights on Crane Co., T.M. Evans had already taken over more than thirty companies through the same proven formula. After he won control of a business, he streamlined it, then instituted tight fiscal controls until it began to generate cash, then used that money to buy yet another firm. He was a master of mergers and acquisitions, and his takeover tactics proved to be a forerunner of those employed by leveraged buyout specialists who made front-page headlines during the 1980s.

By Christmas of 1957, T.M. Evans had purchased 90,000 shares of Crane Co. stock (out of a total of 2.37 million), making him a formidable shareholder. Believing the time was ripe to make his move onto the board, he arranged an introduction to Mark Lowell, Crane's executive committee chairman. Following that call, Lowell immediately went to see Stearns to discuss the forty-seven-year-old Evans, whose highly publicized reputation as one of Wall Street's most feared corporate raiders was well known to both men.

Thomas Mellon Evans

Mark Lowell extended an invitation to T.M. Evans to join him and Neele Stearns for lunch in Chicago in January 1958. Never one to mince words, Evans quickly came to the point: his formidable stock holdings had earned him a seat on the board, he claimed. He asked to be added to the slate of directors to be elected at the upcoming board meeting in April. This came as no surprise to Lowell and Stearns, but Evans's next request was a real shocker. According to one account, "a pall fell over the luncheon when Evans remarked unblushingly that he hoped the directors would let him set policy." Clearly, Evans had his eyes on their positions: chairman and chief executive. They would have to talk it over with the other members of the board, they told him.

Several weeks went by before Lowell picked up the phone and called Evans, telling him that his plan simply wouldn't work out, and that in fact, there wasn't even a spot for him on the board. But T.M. Evans was not the kind of man to take no for an answer. He attended the next stockholders' meeting in April and refused to vote his shares for management's proposed slate of directors.

Early in 1958, a number of investment groups began to acquire large holdings of Crane stock, and rumors began to circulate of a potential raid on the Company. The 1958 annual meeting season had given rise to the greatest number of proxy contests for corporate control that American business had ever witnessed. Potent yet short-lived, the 1957–1958 recession had generated a good deal of stockholder unrest, and the publicity given recent proxy fights triggered more dissatisfied stockholders into thinking about taking similar action. President Stearns heard such rumblings about Crane Co. as well, but said that a raid would not influence his long-range program to rebuild the organization.

CLEANING HOUSE

Neele Stearns launched his recovery plan and began to dispose of marginal operations not associated with Crane's major lines of business, including the Toledo Desk and Fixture Division, which manufactured steel kitchen cabinets and had been unprofitable since its acquisition in 1952. Evans was quick to condemn the deal publicly because that business had been valued at $2.5 million, yet Stearns had sold it for only $600,000. With substantial operating losses from the Company's titanium venture, Stearns then liquidated Cramet, Inc., and turned its facilities over to the U.S. government. The Company also discontinued the manufacture of boilers and radiators at the Chattanooga division, which had also suffered from serious operating losses throughout the 1950s.

When Crane Co. announced at the close of 1958 that sales had slipped from $379 million the previous year to $336 million, Wall Street took notice—and so did T.M. Evans. According to President Stearns, this drop "was largely attributable to the general business recession." Honing his strategy to take control of Crane, Evans turned to Washington power broker Art Landa, who arranged an invitation for him to meet one of the Company's largest shareholders. Emily Rockwell Crane Chadbourne, the daughter of Crane Co.'s founder, was a well-known Washingtonian, a patron of the arts, who had received the French Legion of Honor for resurrecting a lost panorama of Versailles by the American Federalist painter John Vanderlyn. She was also the proud owner of 121,000 shares of Company stock—the most of any surviving member of the Crane family. T.M. Evans managed to convince Mrs. Chadbourne that he could restore the Crane Company to its former greatness, like a phoenix rising from the ashes. He also agreed to place her great-nephew, Robert B. Crane, who worked in the Company's merchandising department, on the Crane board of directors. Succumbing to his considerable powers of persuasion, she agreed to let T.M. Evans vote her shares.

Rumors of a brewing proxy fight at Crane Co. were spreading through Wall Street like wildfire—with the aid of Evans's able publicist. At a board meeting on January 12, 1959, Evans and Art Landa were invited to attend, and Evans easily won a seat on the board. He immediately received permission to tour all Crane Co. facilities throughout the United States, and observed the odd juxtaposition of antique and modern machinery at the Chicago Works. At warehouse after warehouse, he saw stockpiles of inventory. He added up the cost of operating the Company's far-flung network of 172 sales outlets from which Crane sold its vast line of products that included a full range of items for plumbing contractors. Nearly one-third of the valves Crane Co. produced were so specialized that they were not even included in the catalog.

Evans began to negotiate with Crane management, offering Stearns a ten-year consulting position with the Company in lieu of the presidency. Stearns declined the offer and announced his resignation shortly before the annual meeting in April 1959. Whatever apprehensions the board members had about T.M. Evans, they agreed that his election as chairman and chief executive was incontrovertible. Through his formidable holdings and control of Mrs. Chadbourne's shares, the Company was nearly in his control by then. Robert B. Crane was also elected to the board, as Evans had promised.

The Crane family, painted in 1875 by Theodore E. Pine (1828–1905). Chicago Historical Society.
Left to right: Herbert Prentice Crane, Richard Teller Crane, Jr., Mrs. R.T. (Mary Prentice) Crane, Mrs. Frank Rattray (Frances Crane) Lilly, Charles Richard Crane, Richard Teller Crane, Mrs. Thomas Lincoln (Emily Crane) Chadbourne, Mrs. Adolph Frederic (Kate Crane) Gartz, Mrs. Edmund Allen (Mary Crane) Russell.

RAPID RESTRUCTURING

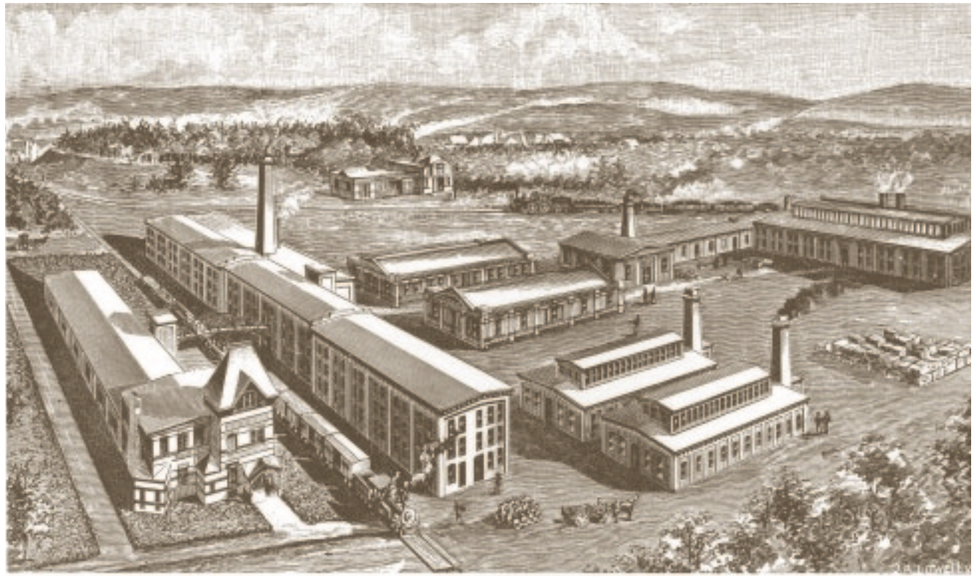
T.M. Evans quickly brushed aside the time-honored Crane Co. culture that relied on a team approach to decision making, one where top managers took their time to reach a consensus before acting. According to his biographer, Diana Henriques, Evans quickly dispensed with the status quo and immediately began to implement his ideas for improving profits. "There were no committee meetings, no task force reports," said Henriques. One journalist characterized him as a "whirlwind" that cut a wide swath through the organization, slashing inventories, pruning manufacturing until existing supplies were sold, and laying off some two thousand employees—all this within his first sixty days in office.

Although Crane Co. had a fine product base, T.M Evans observed that the Company-owned branch network had expanded to such an extent by 1959 that distribution was a greater part of its business than manufacturing. Many branches were not operating profitably and were catering to the needs of plumbers and contractors at the expense of Company shareholders. Evans therefore slashed the number of branches from 130 to 53 in one year, and replaced them with carefully selected local and regional wholesalers who would sell Crane Co. products. Those branch offices remaining were then reorganized into a separate "profit center" called the Crane Supply Company.

Determined to decentralize Crane Co., Evans followed a strategy that had worked for such companies as General Electric. It was the same approach he had learned from his mentor at Gulf, William L. Mellon, and one that had proven so successful at H.K. Porter. He believed that the various Crane divisions should manage their own operations, yet finances would be strictly controlled at the top. Evans reorganized the operating divisions of Crane Co. into four autonomous groups: the Industrial Products Group, the Plumbing-Heating-Air Conditioning Group, the Crane Supply Company, and the International Group. He also began to form a Systems and Controls Group, designed to place the Company at the forefront of the rapidly growing field of automation and automatic valving.

Dante C. Fabiani

To run Crane Co.'s operations on a day-to-day basis, Evans recruited Dante C. Fabiani as executive vice president in 1960 (and president that same year). Fabiani was an accountant by training and highly skilled in financial control systems. He was also very supportive of the people running the Company's operations. Together, they took a fresh look at Crane Co. with a degree of financial insight that had been lacking for some time. Under Evans's dynamic lead, they set out to transform Crane back into a powerhouse of profitability by rapidly pruning lackluster lines and expanding those businesses with greater earning potential, through both domestic expansion and foreign acquisitions.



Chapman Valve Manufacturing Company facilities, Indian Orchard, Massachusetts

BUYING SPREE

By the end of Evans's first year at the helm, five new operations had joined the Crane family. "You can't stand still," Evans told a reporter from *Newsweek* in 1960. "You've got to grow. Otherwise, your stockholders lose." In October of 1959 Crane Co. expanded its valve line substantially through the acquisition of the assets of the Chapman Valve Manufacturing Company of Indian Orchard, Massachusetts, an organization that traced its roots to an ingenious Boston engineer who started his business in 1870. Crane Co. had sold the Bridgeport, Connecticut, plant in 1941, and with the addition of the Chapman assets once again had valve-manufacturing capabilities in the eastern part of the nation.

Other early acquisitions included the assets of the National-U.S. Radiator Corporation of Johnstown, Pennsylvania, which manufactured products used in boilers, furnaces, and air-conditioning systems (which was becoming a booming business in the postwar years). This 1960 acquisition promised to meld easily with the Company's existing line of plumbing products.

That same year Crane Co. acquired the assets of the Autronic Division of Swartwout Company of Cleveland, Ohio, a pioneer in the development of electronic control systems and valve controls. Crane also purchased the assets of the Cochrane Corporation of Philadelphia, further strengthening its industrial manufacturing capabilities. A descendant of the famous Harrison Safety Boiler Works, Cochrane manufactured water-treatment equipment—a natural extension of Crane Co.'s growing fluid-control line.

By the close of 1960, Evans had added nine manufacturing plants that produced plumbing, heating, air-conditioning, and water-conditioning equipment. He modernized many domestic Crane Co. facilities and sold off outmoded plants. Further expansion was accomplished through a stepped-up research and development program and an engineering center at Johnstown, Pennsylvania, which led to new product lines, for both industrial and home use.

Crane Co.'s base in fluid control was further broadened through the 1961 acquisition of the assets of the Deming Company, a well-regarded manufacturer of

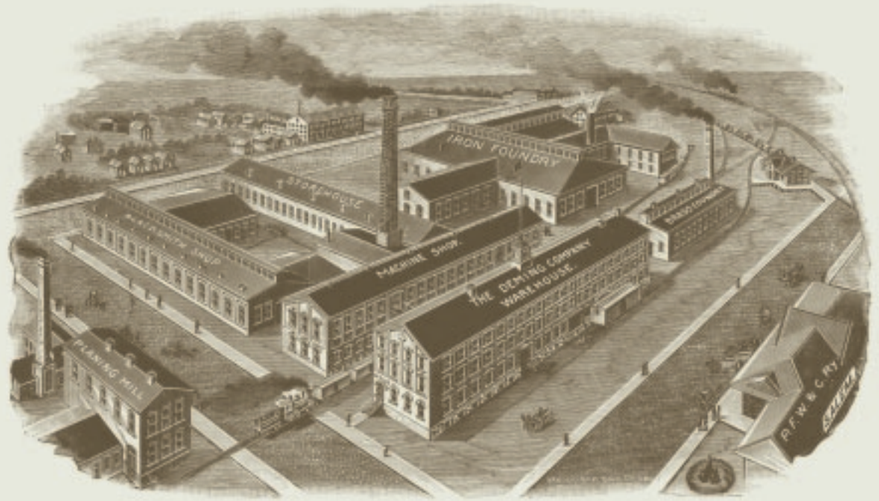
IMPROVED

Porcelain-lined Pitcher Pumps.

WITH BRASS VALVE SEAT.

Fig. 135.—With Close Top.

Fig. 136.—With Open Top.



The Deming Company, Salem, Ohio

PIONEERS IN SAFETY

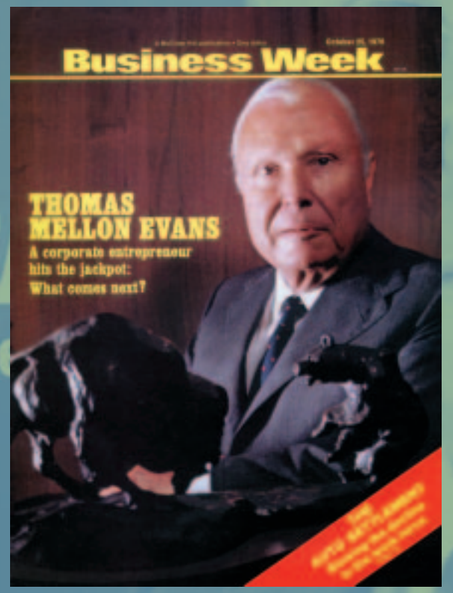
Cochrane traced its roots to mechanical engineer Joseph Harrison, Jr., who was designing steam locomotives in the 1840s and realized that a remedy needed to be found for the all-too-frequent boiler explosions of his day. He decided to build a better, safer boiler, which earned him many industrial and scientific awards in the United States and abroad. The Cochrane Corporation's history is full of extraordinary achievements, including the 1885 invention of the first practical means of removing oil from exhaust steam, which allowed steam to be recycled as a heat source for boiler feed water. In 1902 Cochrane also pioneered the revolutionary application of heat as an aid in water softening, and in 1960 it launched the neutralization of wastewater through ion exchange as a viable alternative to large settling chambers.

both residential and industrial pumps and water systems mainly serving the Midwest and Mexico. In 1965, Crane purchased the assets of the Chempump Division of Fostoria Corporation, another fluid-control company. Originally founded in 1946, Chempump specialized in leak-proof canned motor pumps. The company was an innovator in such critical applications as missile fueling, mercury handling, and circulating radioactive water in nuclear power plants. Handling fluid temperatures that range from –300°F to over 1000°F, Chempump also pioneered the development of specialty control valves for cryogenic, nuclear, toxic, and highly corrosive fluids. With construction activity booming in the 1960s, Crane Co. strengthened its building products line through a controlling interest in Huttig Sash & Door Company of St. Louis, Missouri.

Cochrane feed-water heater and purifier.

USS Enterprise, *the world's first and finest nuclear-powered aircraft carrier, carries Crane and Chapman valves throughout, as well as Cochrane deaerating feedwater heaters and drain regulators.*

In 1885, only twenty-two years after Harrison Safety Boiler Works (HSBW) was founded, the direct contact boiler feedwater heater was introduced for commercial operation. In 1921 Cochrane Corp. introduced the counterflow deaerator while the cross-flow deaerator followed in 1924. Later, in 1929, the parallel downflow deaerator was introduced. The counterflow and parallel downflow designs are the primary designs used today by most deaerator manufacturers. Originally, deaerators were made through the assembly of many cast-iron plates cast in Cochrane's own foundries, and riveted together. There are still riveted units in service today. Once it became more economical, rolled and welded steel plates were used for fabrication. One of the most important developments was the introduction of the atomizing deaerator for marine applications. Beginning in 1930, many U.S. warships used Cochrane's deaerators with their boilers. This design was smaller, making space for additional fuel and cargo, but also improved operational economies and helped to improve the speed of U.S. ships. Cochrane deaerators continue to be used on many navy ships today including the Nimitz, Enterprise, *and the latest aircraft carrier, the USS* Ronald Reagan, *among others.*



Business Week , *October 25, 1976. Reprinted by permission.*

THE BIRTH OF THE MULTINATIONAL CORPORATION

Following this major surge in domestic expansion, T.M. Evans turned his attention abroad to explore new opportunities for growth. Many large American businesses had already made serious inroads into foreign markets by the late 1940s, and he believed that Crane Co. had some catching up to do. He discovered that a significant portion of the Company's income was coming from somewhat small, neglected investments in England, Canada, Holland, and France. In order to strengthen the Company's position in Europe so it could participate fully in the European Economic Community (established in 1958), Evans formed Crane, S.A., Geneva, in 1960 to handle foreign investments and sales on the European continent and Crane International for sales in South and Central America.

Within two and a half years, Crane Co.'s global manufacturing capacity increased from thirteen to fifty plants. The Company was now truly global in scope, with manufacturing operations in England, France, Italy, The Netherlands, Mexico, Canada, and Australia. The new valve plant in Australia, completed in 1962, proved successful from the very start; a mere three years later, plant capacity at Crane Australia Pty. Limited was increased by 70 percent. Crane-FISA, S.A., was established in Bilbao, Spain, in 1963, and Crane Canada Limited added new valve-manufacturing facilities in 1964 and again in 1966. That same year the English subsidiary, Crane Limited, acquired a majority interest in the Scottish firm Glenfield & Kennedy Holdings Limited. A well-known innovator in flow-control systems and equipment, Glenfield & Kennedy supplied Crane Co. with increased manufacturing capabilities, as well as new products and markets.

The age of the multinational corporation had truly arrived—and Crane Co. was riding that wave. To help manage the operational challenges posed by such rapid foreign and domestic expansion, T.M. Evans tapped into a revolution that had been sweeping through American firms since the end of the 1940s, one that was transforming the very structure of companies along multidivisional, decentralized lines.

Many U.S. companies had found that foreign expansion put a strain on their centralized structures, fueling a reorganization movement. Like other business mavericks of the era, T.M. Evans rapidly transformed Crane Co. into a modern, sprawling, decentralized empire of diverse operations, controlled through finances, with the central office acting as a bank that treated divisions like potential borrowers. This financial model of the corporation led many to abandon the idea that corporate activities needed to be linked, at least not by common technologies or markets.

Business Week first observed this phenomenon in 1956, calling these new decentralized holding companies "polyglots," a term that later morphed into "conglomerates." These new conglomerates, including Crane Co., developed a new style of management that approached their businesses as a package of diversified assets that required tight financial controls. T.M. Evans, like many other top leaders of this era, focused his energies on choosing the most profitable acquisitions and on analyzing financial data based on a particular subsidiary's performance. "He was never really an operator," his youngest son (now chairman of Crane Co.), R.S. Evans, told *Forbes* in 1995; "he was a financial guy—a balance sheet buyer."

T.M. Evans acquired new companies for Crane Co. because he was betting on their ability to pay off big with large profits not only for himself, but for other shareholders like him. "I've always felt," Evans told reporters at a press conference, "that the stockholders are the true owners of business." He measured profits and analyzed losses in order to maximize return on shareholder investment. He let his senior executives decide how to meet the rigid financial targets he set for them. "He has a great facility for keeping everyone on their toes and completely mentally alert," said Crane Co.'s president in charge of day-to-day operations, Dante Fabiani. "We have to do our homework."

CRANE IN SPACE

Hydro-Aire coolant pumps have operated at the heart of the environmental control systems in space in such projects as the Lunar Excursion Module and the *Apollo* program. In 1970, during *Apollo* 13's flight to the moon, a crippling explosion occurred on board. The coolant pumps were one of the few fully operational elements and maintained module and crew temperatures through to the successful end of the aborted mission. NASA determined that the pumps' continued operation was so critical that they required a Hydro-Aire support crew be connected by telephone to Mission Control twenty-four hours a day to provide needed engineering support. Today, Crane pumps and electronics are on Mars.

ONE GIANT STEP FOR CRANE CO.

Reorganization, growth, and prosperity were the keynotes of American business during the "go-go years" of the 1960s as the nation became the world's economic superpower, fueled by an accelerating wave of innovation in business practice and international commerce, technology and science. Direct foreign investment by U.S. companies increased from $12 billion in 1950 to $79 billion by 1969. Under T.M. Evans's leadership, Crane Co., too, was becoming a mighty, global industrial giant, ready to seize new opportunities in a rapidly changing marketplace.

One such opportunity materialized in 1961 when President John F. Kennedy pledged to put a man on the moon by the end of the decade, launching a $1.8 billion, ten-year space exploration program. "America has tossed its cap over the wall of space," President Kennedy told the country, "and we have no choice but to follow it." Crane Co. followed it, too, as a prestigious opportunity for its Hydro-Aire division. The stunning advancement of the aerospace industry during the sixties stimulated innovation and provided new, growing markets for a number of Crane's operations. An important partner of the U.S. space team, Hydro-Aire developed coolant pumps for the *Apollo* program's life-support environmental control systems. When the National Aeronautics and Space Administration (NASA) succeeded in landing the first man on the moon on July 20, 1969, Hydro-Aire's coolant pumps were used in the lunar landing module, the *Eagle*. Hydro-Aire continued to supply NASA with a variety of pumps for subsequent missions as well as for the U.S. Air Force's Manned Orbital Laboratory. Chempump provided the only regenerative pump used in the *Gemini* and *Apollo* space programs, and Crane Co. valves were commonly employed in many space simulation test installations.

The Brookhaven National Laboratory also relied on Crane valves and pumps for its elaborate test studies on solar energy generation. During the 1970s, valves, pumps, and fluid-handling products that Crane Co. developed for space applications also proved to be adaptable to industries in which pressure and temperature extremes were common, such as the nuclear power and continuous process industries.

R.S. Evans

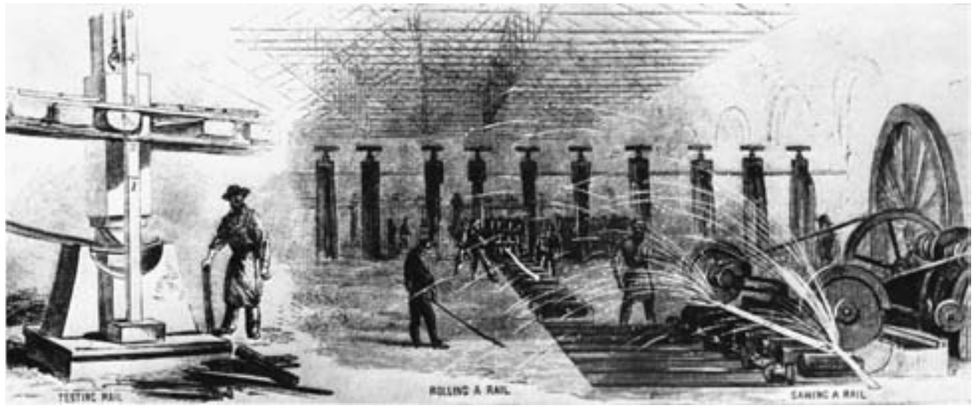
DIVERSIFICATION

Crane Co.'s aerospace business was thriving and generating substantial profits to help fund even greater expansion. In this growth-crazed marketplace, American firms were encouraged to increase their earnings per share through rapid-fire acquisitions of diverse companies. Many were looking far beyond the boundaries of their established industries for fresh opportunities. Businesses such as General Electric and DuPont were setting the trend toward diversification, exploring new pathways dictated by technological capabilities and market opportunities. Wall Street was growing increasingly enamored with the impact of these acquisitions on companies' earnings per share, and general enthusiasm for conglomerates by analysts as well as journalists helped drive the heady years of the 1960s stock market boom. The Dow Jones industrial market index soared from 535 points in 1962 to 985 points by the close of 1968.

That same year R.S. Evans joined the Company after earning his MBA at Columbia University, and reporting to Vice President and Controller James O'Brien, Jr., he helped search for promising businesses for Crane Co. to acquire. Shell Evans, as he is known to his friends, family, and colleagues, came upon an intriguing opportunity that would steer Crane into brand-new territory: the CF&I Steel Corporation, originally known as Colorado Fuel and Iron, a legend in the mining industry, formerly owned by the Rockefellers. Shell Evans performed the analysis on CF&I and presented it to his boss, who took it to T.M. Evans—a leader who gave his senior staff a serious amount of latitude to find interesting deals.

During this period, the domestic steel industry was suffering from increasing foreign competition, labor problems, and outmoded facilities. Fully aware that making steel in the United States had become an extremely problematic venture, T.M. Evans believed that CF&I was greatly undervalued and was confident that he could turn it around through rigorous streamlining and modernization of its facilities.

By 1974 Crane's bet on the steel industry was paying off handsomely, and T.M. Evans continued to wage takeover battles for the Company throughout the decade. In 1975 he went after the Anaconda Company, the nation's third largest copper producer, in a highly publicized hostile takeover battle. Evans's bid failed, but he managed to earn Crane a profit of $57.6 million on the Anaconda shares he had purchased on behalf of the Company. "It's one of the best investments I have ever made," he told *Business Week* in 1976. Without a doubt, during his tenure at Crane Co. Co., T.M. Evans had built up one of the most dramatic growth records in the history of U.S. business.



An early drawing of CF&I's steel rail production stages.

But business is cyclical and the winds of change were blowing once again. The extraordinary affluence of the 1960s had given way to belt-tightening during the 1970s, a decade plagued by oil and environmental crises. The pace of the aerospace industry had slowed to a crawl. Productivity increases at many American businesses had slid to zero, and the annual rate of inflation was approaching 15 percent. In nearly every major industry, from automobiles to electronics, from steel to tires, the race for market share was on. In the new global battlefield, many old-line organizations failed to survive. Although Crane Co. was anticipating the ever-changing needs of its clients by strengthening its lines of business both domestically and globally, profit margins were being squeezed by foreign competition and increasing overhead costs.

Under the leadership of T.M. Evans, diversification had generated both opportunities and challenges for the Company. In 1978, Crane Co. moved further away from its core strengths in highly engineered industrial manufacturing through the acquisition of the Medusa Corporation of Cleveland, Ohio, a cement producer. "We try to give shareholders a hedge against inflation," T.M. Evans told *Business Week*. "We try to buy value."

As the 1980s began to unfold, competition within the broader business arena was heating up—even AT&T's monopoly unraveled. Many business enterprises were now facing unprecedented competition from Japan and Europe; Crane was no exception. T.M. Evans was approaching retirement age yet had not developed a plan of succession to help steer the Company through this rising economic maelstrom. The increase in both the scope and scale of the business had generated a pressing need for strategic and organizational redefinition, but in 1984 T.M. Evans told the board of directors that he intended to sell Crane Co. to a Wall Street investment firm (minus the now ailing CF&I Steel Company, which was dragging down Crane's profitability). But the board, under the leadership of the Company's able executive vice president, Shell Evans, was determined to prevent that sale from happening.

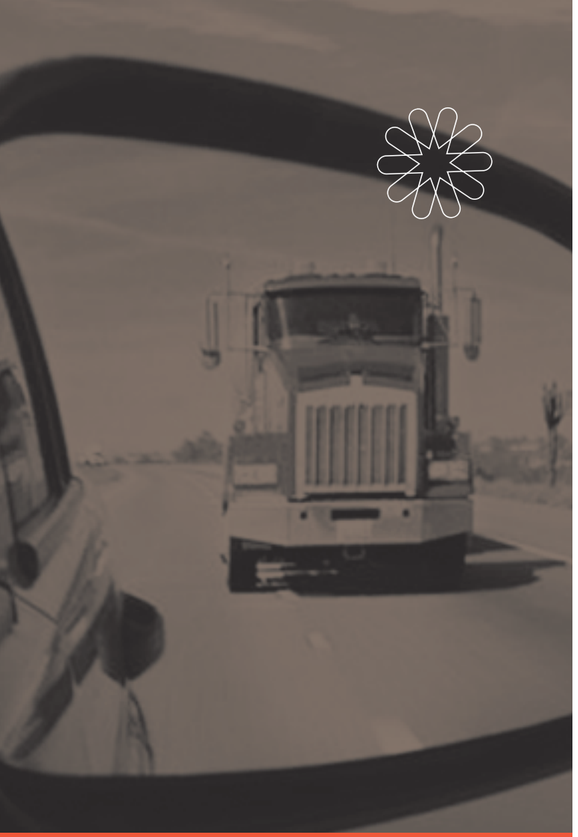
CF&I Steel Corporation, originally known as Colorado Fuel and Iron, a legend in the mining industry, formerly owned by the Rockefellers.

(SEATED FROM LEFT) ROBERT S. EVANS, CHAIRMAN, CHIEF EXECUTIVE OFFICER, AND PRESIDENT; R. KENNETH WHITLEY, VICE PRESIDENT, FINANCE AND CHIEF FINANCIAL OFFICER; RICHARD B. PHILLIPS, VICE PRESIDENT, HUMAN RESOURCES. (STANDING FROM LEFT) PAUL R. HUNDT, VICE PRESIDENT, SECRETARY, AND GENERAL COUNSEL; ERIC G. DALRYMPLE, TREASURER; MICHAEL L. RAITHEL, CONTROLLER

CHAPTER FIVE

The Growth Company

ON FEBRUARY 27, 1984, Crane's board of directors debated that proposal to sell the Company. Echoing his father's own philosophy, Robert S. Evans argued that the deal simply wasn't fair to shareholders because the proposed buyout would have saddled them with the struggling CF&I Steel Company, while the investment group would have walked away with the cream of the crop. Agreeing to disagree, T.M. Evans resigned, and the board immediately elected Shell Evans chairman and chief executive officer. The board then took the buyout proposal under further consideration, seeking financial and legal counsel, and two weeks later publicly announced its decision to reject the offer. As expected, Crane stock began to slide as investors made their disappointment known.



ON THE ROAD

Kemlite's wide fiberglass-reinforced plastic panels help trucks and their drivers roll across the distribution networks of the United States and Europe with ease and efficiency. This lightweight material has replaced aluminum and heavy wood since 1974 and transformed the refrigerated trailer industry by decreasing costly maintenance, increasing fuel efficiency, and making long hauls with consistent cooling temperatures a reality. Since the 1980s, innovative translucent roofs have made the work of getting goods to market easier with improved visibility for loading and unloading. And in the 1990s, the introduction of extra-long panels enabled the industry to build dry freight trailers with these advantages. Crane keeps progress rolling by helping the trucking industry continuously improve from the old way to a better way.

Turning adversity to advantage, the board then voted to repurchase about $40 million worth of Company stock, including all of T.M. Evans's holdings. In the days that followed, the repurchasing of undervalued Crane Co. shares would prove to be a hallmark of Shell Evans's strategy to consistently build shareholder value year after year.

BACK TO BASICS

With his proven track record in running Crane's operations as executive vice president, Shell Evans stepped easily into the top job and rolled up his sleeves. There was plenty of work to do. "I took over Crane in 1984 when it was in pretty bad shape," the chairman recently recalled. "Most of the businesses were losing money. We had a steel company [CF&I] that was in desperate shape, a cement company [Medusa] that was losing money, and the fundamental valve business was very difficult. There really wasn't very much there." Substantial losses in the domestic and international valve, pump, and distribution businesses needed to be addressed, and Crane's dependence on such capital-intensive, highly cyclical, and commodity-oriented businesses as steel and cement called for strategic and organizational redefinition, as well as a fresh approach to manage that change. From his early mentors at Crane, Shell Evans had learned the value of supporting the people on the front lines of operations. That kind of support, he knew, would help him forge a committed cadre of leaders that shared the same passionate dedication to rebuilding a better Crane Co.

Paul Hundt, vice president, secretary, and general counsel from 1976 to 1996, was part of Shell Evans's team and characterized his distinctive new approach as very cerebral, very intense, and very thoughtful—one that was much more focused on the Company and its people than that of his predecessor. "T.M. Evans could read financials and make very fast decisions," Hundt explained; "he was essentially a brilliant financier and trader, but traders aren't focused on building businesses and don't really think very far ahead." Working closely with the other officers of the Company, Shell Evans began to develop a long-term strategic plan to refocus Crane into highly engineered, light-to-medium manufacturing for growing niche markets and wholesale distribution. This, he and his team believed, would stabilize earnings and, with less capital required to operate the various business units, vastly improve cash flow and build shareholder value.

THE ACQUISITION OF UNIDYNAMICS

In February of 1985, Shell Evans launched that strategy for growth—one that would make Crane large enough and financially sound enough to ward off any hostile takeover attempt—with the friendly acquisition of UniDynamics Corporation of Stamford, Connecticut, for about $192 million. "It's his [Robert S. Evans's] first big move," said one analyst at the time, "and he paid a very full price."

That move was a significant departure from his father's strategy, which championed the rapid-fire, hostile takeover of undervalued companies, followed by a cost-cutting diet to make them more profitable. "My father was a clear value buyer," the new chairman and CEO told *Forbes* in 1985, "looking for hard assets. But the economy has shifted to higher-technology, more service-oriented businesses. You need a different approach these days. You can't buy good high-technology companies at book value, because those aren't high-investment businesses."

Crane Co. found a match in UniDynamics. Formerly known as the Universal Match Corporation, UniDynamics had capabilities in specialized manufacturing, particularly in the defense industry, that seemed to be a good fit with Crane's efforts to move into more profitable, higher-technology, growing niche markets. Though the initial appeal was the potential to leverage cutting-edge technologies developed for the defense industry into nonmilitary applications, the deal also opened entirely new markets for Crane in engineered materials with Kemlite. A manufacturer of fiberglass-reinforced plastic (frp) panels for trucks and residential and commercial applications, Kemlite became one of Crane's largest and most profitable business units. Two other important Crane businesses, National Vendors and Resistoflex, also came with the deal. National Vendors, a manufacturer of vending machines that served the U.S., Canadian, and European markets, presented another opportunity for growth. Although National Vendors was unprofitable at the time of the merger, Shell Evans foresaw that, with the right people in charge and the right strategy in place, this unit could flourish. Resistoflex, a manufacturer of lined pipe and hose products, complemented and extended Crane's traditional fluid-handling product lines into new applications.

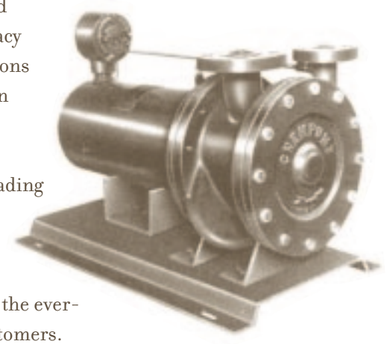
PURELY RELIABLE

Resistoflex ingenuity has continuously improved the process of lining pipe, fittings, hoses, and valves with plastics since the 1930s. Early hose products met the challenge of stresses placed on World War II aircraft running hotter and longer. After the war, engineers developed pipe and fittings lined with a remarkable new material, later to become known as Teflon®, revolutionizing the handling of highly corrosive fluids. "Resistoflex Reliability" became its hallmark, and its products found widespread use in mission critical applications, in space, on land, and under the sea. Further innovations in materials and joint designs have made handling dangerous fluids safer. Today, Resistoflex ingenuity helps the semiconductor and biopharmaceutical industries to work with ever higher standards of purity to develop breakthrough technology.

REBUILDING THE CORE

While Crane's management initially ran UniDynamics as a subsidiary, the team quickly integrated all of its various units into Crane Co., beginning with the UniDynamics management team. "UniDynamics had much more efficient financial systems in place," explained Mike Raithel, who came from UniDynamics as controller of the new organization, "and Crane was lagging behind in the computerization of its operations, so we upgraded across the board and introduced a much more rigorous budgeting process." Along with improved corporate systems throughout the Company's operations, the balance sheet began to improve. And underlying that postacquisition growth was a business philosophy that would flourish under the example set at the top. "I think the strength of Crane has been financial integrity," said Ken Whitley, vice president, finance and chief financial officer from 1985 to 1989, "and Shell has had a lot to do with that. It's a fair environment at Crane—but tough. If you went to work for us, you had to be honest. Admitting mistakes is encouraged, but cover-up is never tolerated."

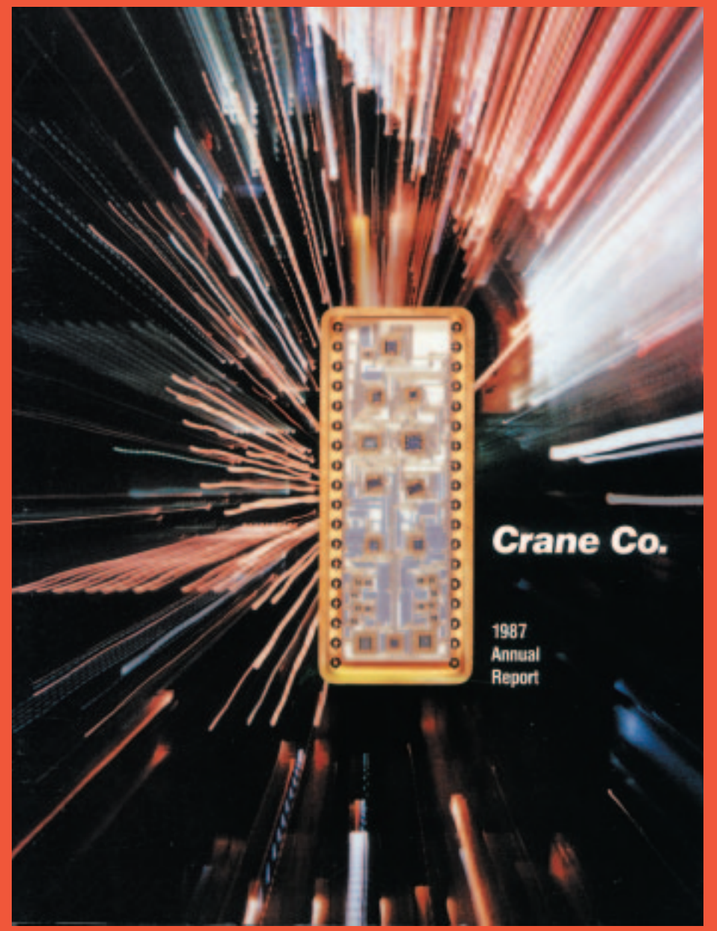
With the financial system strengthened and guided by a solid set of core values, Shell Evans and his new team set out to strengthen and modernize the various units through a carefully crafted strategy that called for selling or spinning off less attractive businesses; closing or consolidating a number of plants; returning profits back into the businesses to upgrade machinery and facilities and launch new products; and acquiring higher-technology companies in growing niche markets that fit well with existing lines of business.



Restructuring included the sale of Crane's legacy U.S. plumbing operations and a renewed focus on improving the valve businesses. This was accomplished by upgrading foundries to increase production efficiency and broadening the product range to meet the ever-changing needs of customers. An improving domestic economy buoyed sales at Huttig, and new equipment and product lines at Chempump, combined with more aggressive marketing and sales tactics, led to improved profitability in that unit.

The Company was also marching in step with the unfolding electronic revolution at businesses such as Hydro-Aire. By rapidly computerizing its operations, that unit was achieving new operating efficiencies and leading the aircraft brake control industry with breakthrough products engineered with the latest fiber-optic sensing technologies and advanced digital electronics.

Huttig's marketing strategy of vertical integration and increased penetration of the remodeling, replacement, and residential construction markets dovetailed beautifully with an improving domestic economy.



The 1987 Annual Report featured the primary place held by digital electronics and fiber-optic sensing technologies.

DE-CONGLOMERATION

While rebuilding Crane's core strengths in engineered, light-to-medium manufacturing and wholesale distribution, Shell Evans also put the wheels in motion to reduce the Company's reliance on highly capital-intensive, cyclical, and commodity-oriented businesses. With major holdings in steel and cement, Crane Co. had strayed far from its intrinsic strength in manufacturing highly engineered products. The need to reduce dependence on businesses that were facing increasing international competition and overcapacity was clear. A new era of "de-conglomeration" started to unfold during the eighties, and to compete more effectively, many organizations were retreating to more traditional, core areas of production, spinning off or selling the more diverse lines of business they had acquired in prior decades.

In 1983, CF&I Steel was in the middle of a $100 million expansion, and by the time Shell Evans assumed leadership the following year, it was out of cash. "Crane advanced them a lot of money," said Evans. "They were in desperate shape, and we were trying to sell it, but nobody wanted to buy it." The domestic steel industry was suffering its worst decline since the days of the Great Depression, facing fierce competition from foreign rivals that were often subsidized by their governments. Many American steel plants were deteriorated and outmoded, especially compared to the ultrastreamlined new plants of foreign competitors. But CF&I began to stabilize in 1984 with an increase in sales of 41 percent over the previous year, and shareholders approved the spin-off of that unit in May of 1985. Five years later, however, CF&I was bankrupt.

Cheap foreign imports and a depressed construction industry were also hammering U.S. cement manufacturers, including Crane's Medusa cement subsidiary. While Medusa Corporation had been very profitable during the 1970s, by the early 1980s it too had become yet another drag on earnings, draining cash that Crane vitally needed to strengthen existing divisions and expand into engineered products through strategic acquisitions. Evans therefore considered selling Medusa, but many cement plants were for sale at that time. With the rise in construction activity in 1984, Medusa Corporation began to return to profitability once again, and Evans wisely decided to hold on to that unit for the time being.

THE REBIRTH OF CORPORATE CULTURE

Sales at Crane Co. grew from $792 million in 1984 to $1.2 billion by the end of 1986. Even more telling, Crane's operating profit skyrocketed from $48 million to $91 million during that two-year period. Clearly, the Evans strategy was beginning to pay off for stockholders. "My father used to say," said Evans, "that you had to run your business for the shareholders." For Shell Evans, that meant building strong businesses and running them well, with an incontrovertible dedication to honesty and integrity.

R.S. Evans assumed leadership in 1984.

In an era rife with corporate accounting scandals and fraud, more and more businesses are now beginning to emphasize the importance of honesty, integrity, and good corporate governance. But at Crane, building profits the right way has been at the core of the Company culture from its very inception. "Shell Evans always wanted to hear the truth," said David Smith, former vice president and CFO of Crane, "and under his leadership, you never once had a question about honesty, integrity, doing the right thing and taking responsibility, which is particularly comforting for a CFO. Crane didn't need today's regulatory environment to get that right. One of Shell's sayings was, 'Not telling the whole truth is not telling the truth.'"

While R.T. Crane's commitment to conducting his business with honesty and integrity had remained fundamental, Evans saw the need to renew the founder's original dedication to customers and employees. Crane Co. had undergone dramatic changes since its formation in 1855 and needed to become, once again, a flexible, fact-driven organization in tune with the needs of its customers and its people. Corporate cultures must shift in step with the times.

But reengineering culture, Evans knew, was a serious undertaking. "It's very hard to change a culture," he admitted. "It takes time, it takes a lot of effort, it takes a lot of communication." It would also require the right tools and the commitment of the entire organization. Under the stewardship of yet another Evans, Crane Co. was destined for greatness once again, but this time through a culture-driven strategy for growth that drew deeply from the Company's greatest strength: its people.

PROVIDING POWERFUL INCENTIVES

In a move later emulated by many companies, the board of directors jump-started that process in 1988 with a grant of 323,000 shares of restricted stock to key managers. "The purpose," explained Shell Evans, "was threefold: one, to retain key management because it vests over five years; two, to provide a direct link between management and shareholders' interests; and three, to offer competitive compensation and benefits." That approach, rooted in the performance culture launched by T.M. Evans at Crane during the 1960s, also spawned the Company's early adoption (1990) of what became known as Economic Value Added incentives, or the EVA system, which awarded bonuses solely on improvements in returns on capital. As *Fortune* magazine noted in 1993, many experts regarded that system as the best way to create wealth for shareholders. It helped align shareholder and management interests and was also a major contributor to the increasing levels of performance that Crane Co. was beginning to achieve. With a steadfast commitment to recruiting, retaining, and motivating the best operating management, Crane was beginning to build a cadre of excellent, experienced leaders throughout the business units.

SEIZING OPPORTUNITIES

In 1988, with cement maker Medusa's improved performance, the timing was right to spin off the business to shareholders, thus finally severing Crane Co.'s involvement in the commodity business, which was too tightly bound to the changing cycles of the economy. At Crane, an enterprise more tightly focused on highly engineered products was emerging—yet one that was still diversified enough to ride out the inevitable downturns that plague such industries as construction and aerospace. By 1989, return on stockholders' equity was 20.4 percent, placing Crane Co. in the top 30 percent of *Fortune* 500 companies. The Company's stock price also rose by 50 percent that year, compared to an average 31.5 percent gain for the S&P 500.

The year 1990 started slowly and ended in recession, yet Crane was well situated to weather this cyclical downturn. Sales dipped modestly for the first time since 1985, but return on shareholders' equity exceeded 20 percent for the fifth consecutive year, placing Crane in the top 20 percent of the *Fortune* 500. One key reason for the Company's continued financial strength was its diversified business mix; downturns, therefore, rarely cut across all units with equal force. While the sagging housing market had a deleterious effect on Crane's business in Canada, National Vendors reported favorable results. A major contract with the U.S. Postal Service to supply state-of-the-art stamp vending machines was helping to propel that unit's earnings and increase in market share, which had grown to 50 percent of the domestic market.

After the brief recession of 1990–1991, the economy began to surge forward once again, and Crane was positioned for a decade-long period of growth, expansion, and profitability. A critical factor in that escalation was Shell Evans's knack for placing the right people in the right jobs to seize new opportunities as they arose. His development team began to implement a rigorous and aggressive acquisition program—the cornerstone of his strategy for growth—to strengthen the core areas of fluid handling, engineered materials, merchandising systems, aerospace, and controls.

KEEPING THE LINES MANAGEABLE

Crane Merchandising Systems has supplied machines that help shorten lines at the U.S. Post Office. In 1989, National Vendors engineered and manufactured an advanced microprocessor-controlled unit to accept $20 bills and dispense sixteen selections of postal merchandise. Today, these machines are still actively used at high-traffic postal locations throughout the United States.

Under Evans's leadership, Crane acquired companies that complemented existing businesses and had leading positions in niche markets. Kemlite was very strong in the frp market in the transportation industry, and the 1993 acquisition of Filon also established that unit as the leading supplier for the recreational vehicle market. Burks Pumps was purchased that same year, tripling Crane's participation in niche pump markets to almost $100 million a year. In 1994 Crane invested in the future with ELDEC Corporation, a maker of electronic and electromechanical products and systems of similar complexity to those produced by Hydro-Aire, which left its aerospace division well prepared for the turnaround in that industry that was looming on the horizon. The acquisition of the public company Mark Controls in the same year added synergistic valve businesses and a group of niche industrial controls businesses. These deals transformed the Company and triggered the need to reorganize into six major business segments that were either technologically compatible or complementary: Fluid Handling, Aerospace, Engineered Materials, Crane Controls, Merchandising Systems, and Wholesale Distribution.

The ELDEC acquisition strategy paid off handsomely due to both operational improvements and the boom in aerospace markets. By this time, aerospace had become Crane's most profitable business segment and was helping to drive the Company's extraordinary growth. In 1996, Crane acquired the microelectronics business of Interpoint Corporation, further broadening its capacity to provide power conversion products to the aircraft and space markets, and paving the way for expansion into the growing market for medical devices.

OPERATIONAL EXCELLENCE

As Crane Co. continued the energetic pursuit of attractive acquisition candidates that fit with its companies and met its financial criteria, the business climate in which it operated was steadfastly competitive. Determined to maintain a high rate of growth, Shell Evans and Crane's management set out to build a culture of continuous improvement—one that would constantly make the Company's products better and its manufacturing, distribution, and business processes increasingly more efficient.

One of the leaders of that effort was Ray Boushie, who joined Crane in 1994 to head up Hydro-Aire (and is now retired as group president of Crane Aerospace & Electronics). "In early 1995," said Boushie, "we started a program in California that basically took people off the shop floor and started training them in classrooms." The state of California provided $3 million in seed money for that effort, which was, perhaps, the forerunner of what is now called "Operational Excellence" at Crane. "We found people in our training programs that we never knew we had," said Boushie. "They just developed and blossomed, and we gave them responsibility." Boushie gets credit for crafting the credo "Good people make good things happen," which is widely used at the Company today. "It's the proof and the verification that if you give people responsibility and you give them the authority to exercise it, they really do good things if management just gets out of the way and let's them do it." Corporate training was beginning to translate into new—and unexpected—corporate leaders as well as a more talented, motivated workforce, but one that understood time-tested values.

On a visit to Crane Supply in Montreal in 1996, Evans came across the original credo of R.T. Crane, which someone had put up on the wall, and it struck a deep chord inside him. "We had it framed and sent out copies for all of the presidents of the business units," Shell Evans said, "because I was so impressed with it. I thought it really summarized how you should do business, how you have to treat employees and the customers the right way."

"I don't think Shell anticipated how much this simple act would resonate throughout the Company," David Smith recalled. "Everyone quickly linked the cultural changes he was advocating with this proof of Crane's longstanding values." R.T. Crane's principles now grace the entrance lobbies of most of the Company's global operations.

But that was only the tip of the iceberg. In 1997 Shell Evans launched Crane's Operational Excellence (OpEx) initiative to transform and reinvent the Company's internal workings on a continuous basis, and to institutionalize the very thinking that fosters continuous improvement—always moving toward the goal of "perfection." At Crane, OpEx draws upon the key concepts of Six Sigma and the principles of Lean Enterprise—two mature and widely adopted approaches to business process improvement, pioneered, respectively, by Motorola and Toyota. Crane selected, trained, and graduated its first class of OpEx "black belts" in 1997, making the investment to strengthen the competitive position of every one of Crane's businesses. "The key to lasting results, of course," said Shell Evans, "lies in changing the culture of the entire organization, getting everyone to think in terms of zero defects."

DRIVING STRATEGY

As global competition grew even sharper in 1999 and sales weakened, Shell Evans responded by identifying three critical, interrelated areas in which Crane needed to make solid and continuing progress: intellectual capital, customer focus, and operational excellence. He also found a president and chief operating officer to help drive that three-pronged strategy, Eric C. Fast.

"Crane is by nature a deal company," Shell Evans said, "because the basic strategy of Crane is to take cash flow and reinvest it in the business. And how you do that to create shareholder value is the key." As co-head of global investment banking at Salomon Smith Barney and Salomon Brothers, Inc., with fifteen years of experience in acquisitions, finance, and Wall Street, Fast certainly understood the art of the deal. The board elected him president and COO in 1999, and Shell Evans began to groom him for the top job. "A key initiative that Shell Evans put in place," said Eric Fast, "was for me to come in for a year and a half and do no outside work—strictly be focused on learning the manufacturing business." He spent that time meeting as many employees throughout the organization as he could, learning about the people and manufacturing processes to help him make that transition.

During that period, he and Evans built a solid working relationship based on total trust and openness. "He spent a lot of time sharing with me his observations about the business," said Fast. "It was a marvelous

opportunity for me to listen and learn. And at the same time we quickly established a relationship where I told him whatever I saw—good, bad, indifferent, ugly—and I think that we established a very open kind of communication, and that way we were able to create a dialogue on how to spot opportunities and solve problems."

Strong believers in development and training, they worked together to improve the quality of management and the skills of employees at all levels. Evans and Fast established a virtual "Crane University" to develop intellectual capital, share best practices across all units, leverage Crane's broad skills and capabilities widely, and drive Operational Excellence throughout the organization. They stepped up the focus on meeting customers' needs and determined how well Crane was meeting those needs by holding businesses accountable for improving performance on a formal system of metrics. Businesses were rated on their ability to meet ever-higher standards of customer satisfaction and on their readiness for growth. In addition, Evans and Fast required all of Crane's businesses to work aggressively in the pursuit of excellence—to squeeze waste out of their manufacturing and business processes and to improve performance and service quality—all to make it easier to do business with Crane Co. "Excellence," said Shell Evans, "is a moving target, but we are an improving and increasingly agile company."

Eric C. Fast

Crane's course had changed and improved considerably under Shell Evans's able guidance throughout the seventeen years he served as CEO. Between 1992 and 1998 alone, twenty-four companies joined the Crane family. He consolidated and invested in the business units, made both opportunistic and strategic acquisitions in order to grow Crane profitably, and above all, was a guardian of shareholder value. When Shell Evans became chairman and CEO in 1984, the Company's market capitalization had a value of $194 million; by 2001 that had climbed to $1.8 billion—a record of which he is justly proud. The spin-off of Medusa and Huttig Sash & Door also generated a tidy profit for stockholders. (Since December 1999, Huttig has averaged a 21.7 percent annual return to shareholders.) Much like they did during his father's twenty-five-year tenure before him, earnings per share and the price of Crane stock rose steadily under his guidance. One recent analysis of the twenty best-performing surviving firms of the original 1957 S&P 500 Index ranks Crane Co. as number ten. Between 1957 and 2003, Crane's shareholder return averaged 15.4 percent and earnings per share grew 8.2 percent annually.

In 2001, Shell Evans confidently stepped down as CEO while continuing as chairman of the board, and named Eric Fast his successor. In a business climate marked by the rapid turnover of leadership in many top corporations, a well-developed succession plan is both a sign of great stability and a source of pride for employees. "With a leader that's bleed-through Crane orange like Shell," says Brad Ellis, group president, Merchandising Systems, "this organization has had a constant focus and consistent vision at the top for many years, and that continues under Eric Fast, who is just as passionate about the success of the business."

TABLE 3.1: TOP-TWENTY PERFORMING SURVIVORS, 1957–2003

Rank	2003 Name	Accumulation of $1000	Annual Return
1	Philip Morris	$4,626,402	19.75%
2	Abbott Labs	$1,281,335	16.51%
3	Bristol-Myers Squibb	$1,209,445	16.36%
4	Tootsie Roll Industries	$1,090,955	16.11%
5	Pfizer	$1,054,823	16.03%
6	Coca-Cola	$1,051,646	16.02%
7	Merck	$1,003,410	15.90%
8	PepsiCo	$866,068	15.54%
9	Colgate-Palmolive	$761,163	15.22%
10	Crane	$736,796	15.14%
11	H.J. Heinz	$635,988	14.78%
12	Wrigley	$603,877	14.65%
13	Fortune Brands	$580,025	14.55%
14	Kroger	$546,793	14.41%
15	Schering-Plough	$537,050	14.36%
16	Procter & Gamble	$513,752	14.26%
17	Hershey Foods	$507,001	14.22%
18	Wyeth	$461,186	13.99%
19	Royal Dutch Petroleum	$398,837	13.64%
20	General Mills	$388,425	13.58%
	S&P 500	$124,486	10.85%

R.S. EVANS, CHAIRMAN OF THE BOARD,
AND ERIC C. FAST, PRESIDENT AND CHIEF EXECUTIVE OFFICER,
AT CRANE CO. OFFICES IN STAMFORD, CONNECTICUT

CHAPTER SIX

Passing the Torch

THE TRANSITION WAS SEAMLESS. Working with their top management team, Eric Fast and Shell Evans had laid the foundation for profitable growth in the new millennium by launching a strategic plan to build a more integrated operating company—one that was much more focused on what was important to its customers. They had also spent considerable time building a more cohesive Company culture to propel that strategy. "When I came to the Company, R.T. Crane's values were in place," said Fast. "For seventeen years, Shell Evans had not only sustained those values but also reinforced them. My job became one of carrying the torch for those values as opposed to having to light it."

A TEST

Shortly after Eric Fast became president and CEO, the fundamental strength of those values was put to the test when he received a call from one of the group heads. "We have an R.T. Crane problem," he told the new CEO. A senior executive had cheated on his expense account—a number of times—thus violating the core values of honesty and integrity. "I considered reprimanding him harshly," said Fast, "but for me, it was a decision that was going to be an R.T. Crane legacy decision, so I decided to fire him because it if was OK for him to do it, it was OK for every other officer to get caught cheating once. At Crane Co., that's not the R.T. Crane way. We draw very bright lines around a core value of integrity here. I view that as my first obligation and responsibility." Fast has never once questioned that decision because he knew it was exactly what his predecessors would have done—all the way back to R.T. Crane himself.

"The tone at the top of the Company is integrity beyond reproach," said Gil Dickoff, treasurer since 1989. "Every day when we walk through the doors, we're looked upon to set the example. At the end of the day, Eric, like Shell before him, can sleep soundly. Every multi-site manufacturer with global operations will stumble now and then, but actions taken in the corporate offices are swift." Eric Fast came into the top job at Crane Co. as a tidal wave of corporate-accounting scandals was rocking some American businesses to the core. "I had to worry about none of that here," said Fast. "It's a luxury that gives you a solid base to say, 'OK—let's go focus on business.'"

STRATEGIC LINKAGES

Eric Fast set out to drive his strategy deeper and more broadly throughout the Company to strengthen existing operations internally and build that base through synergistic acquisitions. There were, however, significant challenges to overcome. The tech-stock crash of 2000—2001 had obliterated $2.5 trillion of stock market wealth, triggering a recession, a highly volatile economy, and the worst manufacturing environment in a decade. But perhaps the most unanticipated issue for Crane in the new millennium was the substantial increase in asbestos claims. "When I joined Crane in 1999," Fast explained, "there were only 2,500 asbestos claims against us, but that number began to climb very rapidly in the years that followed." Although the Company never manufactured any asbestos product or any asbestos-containing material, certain valves, pumps, and other products contained asbestos material that was encapsulated inside Crane products.

Executing his strategy in the face of the asbestos litigation required a careful balance. A substantial amount of senior management time was needed to attempt to resolve the asbestos liability, and Crane held back on some acquisition activity to preserve the capital needed for the settlement of claims. Eric Fast did, however, move forward aggressively on his plan to grow by improving existing operations and achieving more consistent results across the organization.

He began by engineering a series of internal mergers and divestitures that resulted in a smaller number of larger units at Crane Co. "Our strategy," explained Fast, "has been to materially improve our existing businesses and grow profits from them, and one way that we're accomplishing that is through what we call strategic linkages. We've had some collections of businesses that we've run independently, but in today's increasingly competitive environment, we've had to look for ways to make them stronger and reduce costs."

In 2001, Fast focused on Crane's ten smallest businesses that were consistently earning less than $5 million a year and seized the opportunity to link them with larger, more profitable Crane businesses. Through a series of "internal acquisitions," he combined the North American commercial and engineered valve businesses in Fluid Handling; integrated CorTec with Kemlite in Engineered Materials; and merged Lear Romec with Hydro-Aire in Aerospace. By merging these businesses together, Crane would gain the same kind of synergies that could be attained from

2001

The structure of Crane's portfolio of businesses... the ABC's of "A Better Crane Co."... has changed dramatically since 2001 as a result of internal mergers, divestitures and key acquisitions.

2005

A

$25 million or more

2001: Hydro-Aire, Eldec, Kemlite, Merchandising Systems

2005: Aerospace Group, Electronics Group, Kemlite, Valve Group

B

$5—$10 million

2001: Pumps, Resistoflex, Engineered Valves, National Rejectors, Inc., Crane Supply, Lear Romec, Barksdale, Interpoint, Valve Services

2005: Crane Ltd., Crane Supply, Resistoflex - Industrial, Crane Pumps & Systems, Merchandising Systems, National Rejectors, Inc.

C

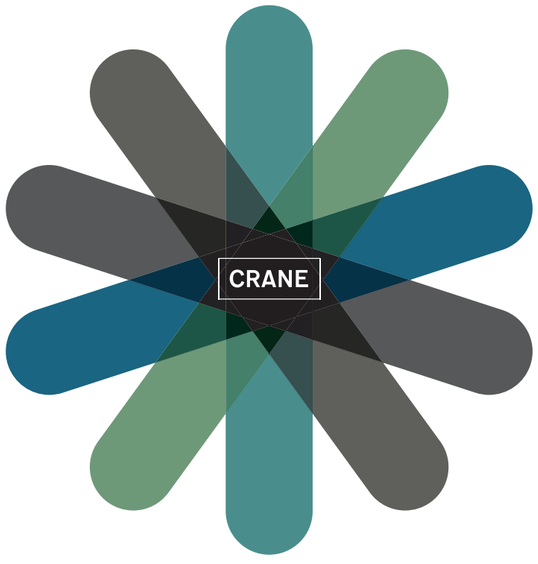
under $5 million

2001: Commercial Valves NA, Crane UK, Crane Environmental, Azonix, Dynalco, Powers Process, CorTec, Crane Plumbing, Polyflon, Ferguson

2005: Barksdale, Crane Environmental, Azonix, Dynalco, Polyflon

Crane *at 150*

As represented by the Crane 150 logo, the Company today possesses strength, transparency, and cohesion. The interlocking parts of the star at the center of the logo form one vibrant and multi-faceted whole, symbolizing the collective power of our distinct businesses (described here) as they come together to form a strategically linked operating company.



Aerospace & Electronics

Aerospace Group
- Hydro-Aire/Lear Romec
- ELDEC
- Resistoflex-Aerospace
- P.L. Porter

Electronics Group
- Interpoint
- ELDEC APP
- General Technology
- Signal Technology

THE AEROSPACE GROUP is the result of the internal mergers of ELDEC, Hydro-Aire/Lear Romec, and Resistoflex-Aerospace. This combination, now under one management team, substantially reduced costs and made this unit a larger, stronger competitor in the market place. The acquisition of P.L. Porter in 2004 strengthened that group even further with its leading positions in both electro-mechanical and hydraulic/mechanical actuation for aircraft seating.

THE ELECTRONICS GROUP was formed to enhance Crane's ability to capitalize on opportunity for growth in microelectronics for the military/aerospace and medical markets. The group was formed through the internal merger of Interpoint and the power supply business of ELDEC. The unit was strengthened in 2002 with the acquisition of General Technology Corporation, a firm that specialized in high-reliability customized electronic manufacturing services and products focused on military and defense applications. In 2003, Crane became a significant presence in military defense electronics with the purchase of Signal Technology. Since the formation of the electronics group, it has grown from a $40 million to a $230 million business.

Engineered Materials

- Kemlite
- Polyflon

THE ENGINEERED MATERIALS segment consists of two business units, Kemlite and Polyflon. Kemlite is the world's largest manufacturer of fiberglass-reinforced plastic (frp) panels for recreational vehicles, truck trailers, building products, and industrial building materials. Polyflon manufactures a variety of highly specialty components, such as substrate materials for antennas. One of Crane's most significant acquisitions of 2002, Lasco Composites LP, brought Kemlite increased presence in the industrial market.

Merchandising Systems

- Crane Merchandising Systems
- National Rejectors

MERCHANDISING SYSTEMS is made up of two parts, Crane Merchandising Systems (CMS) which makes food, snack, and beverage vending machines, and National Rejectors (NRI), which makes coin changers and validators in Europe. CMS has a strong market share in North America and benefits from having a direct sales and service team that enables it to offer excellent customer service. NRI's competitive advantage is double currency capabilities for coin-changing machines.

Fluid Handling

- Valve Group
- Crane Ltd.
- Crane Supply
- Crane Pumps & Systems
- Resistoflex-Industrial
- Crane Environmental

THE FLUID HANDLING segment consists of the Valve Group, Crane Ltd., Crane Supply, Crane Pumps & Systems, Resistoflex-Industrial, and Crane Environmental. In the rapidly consolidating global valve business, Crane combined its eight industrial valve units into a single Valve Group by consolidating plants, shifting manufacturing to low-cost countries, integrating procurement activities to leverage volume with suppliers, and accelerating the sale of existing products into new markets. In 2001, the acquisition of Xomox and Saunders significantly strengthened Crane's position in the global valve industry. Both units brought strong brands focused on high-end application-driven markets in the chemical processing and biopharmaceutical markets, and a global sales and marketing organization. In 2003, Crane acquired the pipe coupling and fittings business of Etex Group S.A., and the following year purchased the Hattersley valve brand and business, a subsidiary of Tomkins PLC, whose branded products include an array of valves for commercial, industrial, and institutional construction projects.

Controls

- Barksdale
- Azonix
- Dynalco

THE CONTROLS segment is comprised of Barksdale, Azonix and Dynalco. Barksdale produces ride-leveling, air-suspension control valves for heavy trucks and trailers, as well as pressure, temperature, and level sensors used in a range of industrial machinery and equipment. Azonix is an established manufacturer of electronic human-machine interface panels for harsh and hazardous environments typically found on oil rigs and platforms. Dynalco makes large engine compressor monitoring and diagnostic systems.

external acquisitions, such as inter-company sales of existing products in new markets.

Other businesses, including Crane Plumbing and Powers Process Controls, were divested because they were small and had no linkages to other key businesses. This process of internal mergers and divestitures reduced the number of businesses from twenty-three to sixteen. The challenge then was to find a way to bind the remaining businesses together in order to decrease costs, increase the quality and consistency of Crane's management teams, reduce business risks, and develop a better understanding of the needs of customers. The key to building performance and financial success, the new CEO realized, rested in the quality of Crane's people and the culture in which they operate.

GOOD PEOPLE MAKE GOOD THINGS HAPPEN

Passionate about learning, Fast accelerated intellectual capital development through the Crane 200 program and Crane University. The Crane 200 program is designed to identify and develop leadership talent throughout the organization, instill common values and develop these key individuals, and then leverage their talent through the "Crane helping Crane" philosophy, spreading it throughout the entire organization.

Crane University, the Company's virtual learning center, also serves as a vehicle for sharing best practices and continuous business process improvement. "We didn't take the time or spend the money to build the building," said Fast, "but we're training our people how to make Crane faster, better, and easier to do business with."

One day each quarter, the business unit presidents and other key leaders gather together "in school" to learn how to be better leaders and then share the knowledge gained within their own companies and across other segments. In 2001, more employees were trained in Six Sigma and Lean principles than the previous four years combined, with $4.5 million spent on 550 employees. The following year the Company allocated $6 million to Crane University, and that commitment has grown stronger each year.

That training is now paying off in unexpected ways. For example, Resistoflex was having some trouble etching tubes lined with polytetrafluoroethylene (PTFE, better known by the trademark Teflon®). It just so happened that Polyflon had an expert who had been etching PTFE for more than thirty years. Even though he was a reluctant traveler, he volunteered to travel from New England to the South, assessed the problem, and suggested a solution. As a result, Resistoflex rapidly moved from a situation in which glitches were constantly stopping production to a point at which it was processing a couple of thousand feet of tubes at a time. "It's amazing how much manufacturing know-how can be found throughout Crane," said Bill Hayes, president since 1993 of Resistoflex. "You have a great sense that you can be open and honest and work through issues and problems across the business units. There's a support structure around you and a culture throughout the organization that embodies the belief that, 'Together, we'll get through it.'"

Crane is a company that believes not only in the power of education, but also in the value of its employees. Everyone is on the lookout for unique ways to help people reach their fullest potential. At Hydro-Aire 15 percent of employees couldn't speak English. Their work was good, but it was difficult for them to contribute their own ideas. "We decided to step outside of the box and do something about it," recalled Greg Ward, president of the Aerospace Group. Partnering with a local college, the Hydro-Aire management team offered employees the opportunity to devote the last two hours of their workday to language study. They built a classroom where employees studied for four hours, two on Company time and two on their own time. Graduation was a speech in English in front of their managers and all the leaders of the Aerospace Group. "That's hard for anyone," said Ward. "The speeches were fabulous. They broke our hearts. They spoke about taking their granddaughter to a restaurant and not being afraid to get change, and going to the grocery store without being intimidated. They also spoke about their desire to be better employees."

FROM OUR TWELVE-MONTH POSTER SERIES

150 YEARS OF CRANE Values

Performance culture based on trust and respect.

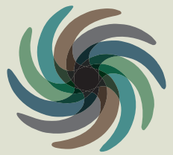
To R.T. Crane, this meant being both hard headed and open-minded. It's not as easy as it sounds. We must question our assumptions; we must listen carefully to coworkers' ideas, then add our own thoughts to see if we can build those ideas into better business performance; and we must trust that our suggestions will receive the same respectful treatment. At Crane, new ideas are welcome, along with equal doses of trust and respect.

Passion for learning.

When you merge passion with diversity, you can spark an exciting and dynamic exchange of ideas. That's what happens at Crane University. People from every area of Crane, all over the world, join to learn a common language with a powerful set of tools including Six Sigma, Kaizen, and Value Stream Mapping, among others. Then together, we break down barriers and build new ways of thinking as one committed team of employees focused on one inspired goal: A Better Crane Co.

Crane helping Crane.

Innovative thinking goes on at all levels of our company, wherever Crane employees confront problems, deal with unforeseen challenges, or work around obstacles to standard procedures. Our goal is to harvest all the lessons — from the front lines and back offices — to create a rich exchange of fresh insights about products, technology, and work practices. The key is to collaborate and to share what you know to benefit others.



Good people make good things happen.

Running our business with the highest-quality people is the best insurance of financial success. We are strengthening our management capabilities by identifying and developing leadership talent through our Crane 200 program. We have put in place a balanced compensation program for all employees that is aligned with shareholder values and designed to reward performance. The fact is, there have never been more professional growth opportunities for Crane employees than there are today.

The class lasted only twenty weeks, but it transformed their lives. Today they are more valuable employees to Crane, but most important, they are more connected to their families and communities.

"We firmly believe," Eric Fast said, "that good people make good things happen. You have to be relentless in improving your people, relentless at improving your business. But it's not enough just to work hard—we have a performance culture with trust and respect."

SHARED TOOLS

"Crane Helping Crane" took root under Fast. Exploiting the synergies between Crane's businesses and competencies, these initiatives have led to innovations, new market penetration, and broader opportunities by working together. "We're working hand-in-hand with the Electronics Group," said Kirk Kelhofer, president of Crane Valve Services, "to combine technology that Signal Technology brings to the table with valve condition monitoring. Together, we're developing a concept that we think is going to revolutionize how valves are monitored throughout the world."

Fast also accelerated and broadened Crane's Operational Excellence approach to continuous business improvement. Crane's own internal training group graduated 1,500 employees to capable practitioners of OpEx over five years. Among the key OpEx approaches is the Kaizen, a team-based event, drawn from Lean principles and focused on process improvement. "My first Kaizen experience was incredible," Bill Hayes recalled. "I wasn't a believer, and we had some very talented people who had gone through the training. They came to me and laid out a Kaizen that they wanted to have at Resistoflex. We had this perfectly running plant that was producing nice margins, and they wanted to tear it apart and start all over again." After two days, Hayes toured the shop floor where the event was being held. "What have I done?" he asked himself. "I had a perfectly well-run operation, and now we can't produce anything." Two days later, they had things back in operation—running better than ever. "I became a true believer," said Hayes. "It was a great breakthrough to be able to leverage people's experience and knowledge and work across units like that."

Best practices learned are also posted online for employees to see, for example, how others are succeeding in leveraging procurement, collecting receivables, and managing working capital. "Everybody has access to this learning at Crane Co.," said Eric Fast. "We believe that if you're not getting better every day, you're falling behind." In developing new products, creating market strategies, attacking operating costs, and streamlining manufacturing, the skillful wielding of OpEx tools at Crane is generating more efficient operations and fostering greater closeness and responsiveness to customers.

Development of OpEx at Crane Co.

1997
First class of twenty Crane employees, from many different business units, is trained in Six Sigma.

1998
Second Six Sigma class is trained in January; by year-end, virtually all of Crane's businesses have at least one black belt.

1999
A range of OpEx tools, including Six Sigma, Lean manufacturing, and focused factories, are aggressively deployed.

2000
Our first Operational Excellence leader is appointed; Crane graduates its first class of master black belts and continues to develop lean black belts.

2001
Close to three hundred Lean experts have been trained and deployed throughout our business units; every business unit president has now completed Operational Excellence leadership training.

2002
Crane University, our virtual training institution, spends $6 million on training, primarily to promote Operational Excellence; key customer metrics reflect the impact of OpEx programs.

2003
Master black belts are moved into operating leadership positions; further improvements are seen in customer metrics.

2004
Each company president becomes the OpEx leader of his business unit. Company-wide focus is on leveraging and accelerating Operational Excellence with a common operating system.

Continuous improvement.

Improving some of the time, in one or two areas, just won't cut it. Our success is built on an accelerated stream of incremental and breakthrough improvements in products, manufacturing, finance, distribution—the works. We have to look for new ways to create value, and then translate those ideas into advantages our customers will understand, appreciate, and act upon.

Helping hands.

In 1904, R.T. Crane said, "A loyal employee gives something besides his labor and the employer should recognize that fact," and toward the end of his life he set aside $1 million as a fund for "the purpose of taking care of my men." Two years after R.T. Crane's death, members of his family honored his wish by establishing the Crane Fund to "provide a means for giving support to deserving and needy employees after they have, by reason of age or disability, become unable to engage in active work." Today that bequest is worth hundreds of millions of dollars and the Crane Fund, along with two other company-managed charitable trusts, lives on as a lesson in the power of individual leadership and responsibility.

Strength through integrity.

This is not a new idea for Crane. We have been committed to the highest standards of business conduct since our founding in 1855. Our founder, R.T. Crane, wrote and spoke extensively about the importance of business ethics and values, about the confidence and goodwill they engender among employees and customers, and how this can be a competitive advantage. Today, his words continue to guide our business philosophy and serve as a benchmark by which we measure our success.

Make it ugly.

Put it under the microscope. Don't dress up the facts. Face up to where things really are, so all of us can easily understand the problem and generate a solution that will really work. By using this honest assessment process as a measurement tool, we can identify the pain points quickly, make improvements, and exceed expectations. At Crane, telling it straight never gets old.

QUALITY FOR A LIFETIME

The Inner Bionic Ear Implant is a surgically implantable device that provides hearing sensation to individuals with severe-to-profound hearing loss who cannot benefit from hearing aids. Cochlear implants are designed to substitute for the function of the middle ear by transforming sound energy into electrical energy that will initiate impulses in the auditory nerve. By developing the electronics for this seventy-year product warranty implant, Interpoint has helped make a lifetime of hearing possible for more than sixty thousand people, including thousands of children who had never heard a sound.

THE VOICE OF THE CUSTOMER

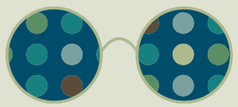
The people of Crane are now strategically linked through the structure of the business, as well as through a Company-wide system of learning that encourages sharing best practices. Another key to building a culture of continuous improvement is by improving customer focus. "One of the things I found when I came to Crane," Eric Fast recalled, "was that we had become very focused only on what was important to us—our own balance sheet and our P&L. Shell and I realized that we needed to have a much more intense focus on what was important to our customers." Throughout the Company, the voice of the customer is the foundation for action. "It's the common thread—the focus on the customer—that binds our companies together," said Rich Schueller, president of Kemlite. "It amazes me how we can find little details in our manufacturing and in our delivery of customer service that we can be better at. The key is to put your whole mind on the business, stay focused on the customer and find ways to take today's work and do it better."

At ELDEC, they did just that. When the U.S. space shuttle *Columbia* broke up on reentry in 2003, NASA wasn't sure what had gone wrong. It turned to ELDEC for help. ELDEC had solid-state sensors that tell when doors are open and closed, and NASA needed to know at what temperature they quit functioning. ELDEC engineers immediately went to work and within a week were able to help NASA piece together the heat signature on the shuttle at the time of the accident. "We pulled everybody in," said Greg Ward, "no questions asked, no thought to bill NASA for any expenses. We felt it was our responsibility to our country." No one at Crane ever questioned that decision. It was simply the right thing to do.

When a customer is in need, Crane reacts. "We had a rather large customer about two and a half hours outside of our plant in Joliet, Illinois," Rich Schueller said. "They had an emergency need for some of our material. We were able to cut into our existing schedule and produce it with about two or three hours' notice. That was fine, but how could we get it to him?" Kemlite couldn't find a trucking firm that would get it

Customer focus.

If we try harder to make a customer than a dollar, we will find that the profit will largely take care of itself. Our future competitive advantage will depend not only on selling products and services *to* our customers, but on co-producing these products and services *with* our customers so they can continuously improve their own capacity for growth. Everyone's job at Crane Co., no matter what it is, is really a job to please the customer.



Competitive perspective.

Have you ever looked at our business through the eyes of our competitors? Really looked? It not only brings into focus all the different ways we add value to our customers' experience, it can also expose opportunities our competitors have overlooked, as well as some of our own faults that we may have overlooked. Fresh perspectives allow us to be bold, to take calculated risks and to move decisively to beat our competition fair and square.

1 + 1 = 3

Materially strengthening our business.

Strategic linkages, acquisitions, organic growth, a smaller number of larger units—there are many ways to strengthen our business. On an individual basis, each of us must stretch beyond simply coming to work each day prepared to do our jobs in the way they've always been done. We must look for connections between things that don't normally go together—in both processes and people—to help us do our jobs in smarter, more efficient ways so that we continue to operate from a position of strength.

Faster, better, easier.

The world is moving ever more quickly. Customers have new demands, competition is keen, and markets are changing. Success will depend on our ability to become faster, better, and easier to do business with tomorrow, next month and next year, which means moving our comfort zone from the old way to the best way.

A BETTER WEIGH

Calculation of an aircraft's onboard weight and measurement of its center of gravity—both critical to safety, fuel efficiency, and optimum passenger capacity—have been, at best, time consuming estimates until now. Crane's AirWeighs™ system converts landing gear struts into scales that measure an aircraft's weight and determine the center of gravity in seconds, versus today's method that calculates this information using average passenger and baggage weights. Automatically measuring actual aircraft weight and center-of-gravity information improves airline operations and enhances aircraft performance while focusing on safety.

down there in time, so the head of the sales department went out and rented a truck with his personal credit card, loaded the material on the truck, and drove it there himself. "He delivered it just in time to meet the assembly needs of that customer," said Schueller.

The aerospace industry has been an important Crane customer since World War II, and while the events of 9/11 hurt all of America, the aftershocks hit the airline business extremely hard. The industry was in a tailspin long before those attacks, saddled with high labor costs, low profit margins, and deep in debt from an ongoing price war. After 9/11, orders for new aircraft were severely curtailed or canceled, and drastically reduced passenger revenues necessitated a rapid reduction in the size of fleets. With the airlines desperate to lower their operating costs to stay afloat, the Aerospace Group found a way to reinvent their services. Where that unit once specialized in providing equipment for new airplanes, it is now developing innovative and successful products for planes already in operation, such as those developed to reduce operating costs for airlines and operators, including AirWeighs, SmartStem, and other wireless technologies. That ability to adapt to the customers' needs—even during the hardest of times—is truly a Crane trademark that dates back 150 years.

Improved customer focus is driving measurable, continuous improvement across Crane Co. "One of the things you learn through OpEx leadership training," Kirk Kelhofer explained, "is how to listen to the voice of the customer. Our customers really wanted a parts lead time in three days, and they wanted us to be able to 'quick ship.'" OpEx gave him the tools to meet those requirements in a minimal amount of time with very little inventory. Across the business units, the people of Crane are deploying these tools to generate "customer value" and increase speed; eliminate all wasteful activities; introduce "mistake-proofing"; employ fact-based decision-making; implement measurements widely and visibly to indicate progress; and then start all over again to reap the next set of opportunities for improvement.

WEATHERING THE STORM

Through the deployment of Eric Fast's strategy of creating a more integrated operating company by building a smaller number of larger, more efficient business units linked by shared tools and shared values, Crane Co. was emerging as a much stronger organization. And when problems arise, they are immediately addressed openly, honestly, and with a sense of urgency. "If you have a problem," explained Fast, "don't hide it. Make it ugly. Make it worse than it is. Together we'll figure out how we can solve it. This kind of openness and transparency is a very healthy, positive aspect of our culture."

That philosophy would prove to be a great source of strength as Crane Co. faced its most challenging legal battle ever. Between 1999 and 2004, the number of asbestos claims against Crane Co. had risen from twenty-five hundred to eighty thousand. Crane's senior management team took aggressive action to address that litigation, and in October 2004, the Company announced a comprehensive settlement with current asbestos claimants and an independent representative of future claimants that was structured to utilize the provisions of section 524(g) of the federal bankruptcy code. Section 524(g) is the only means authorized by Congress for a corporation to resolve its asbestos liability with certainty and finality.

"The cost was substantial," said Gil Dickoff, "but we were convinced that a sum certain, with financing arranged in advance, was an acceptable price for achieving finality on asbestos and getting on with our business." Then, in December, the United States Court of Appeals for the Third Circuit, in the Combustion Engineering case, sharply curtailed the availability and scope of relief offered by section 524(g), and Crane Co. was forced to terminate this comprehensive settlement transaction. "As a result," said Fast, "we will return to the tort system to resolve asbestos claims, and we have established a gross reserve of $650 million ($252 million after insurance and deferred tax asset) to cover the estimated settlement and defense costs for pending claims and anticipated future claims through 2011."

LEVERAGING EXPERIENCE FOR BREAKTHROUGH SOLUTIONS

Crane's VP for Environment, Health and Safety saw the need for a low-cost cleanup for Superfund sites, and he felt that with their thirty-plus years of experience working with metals, experts in the Company's Polyflon unit could innovate a solution. Armed with a kitchen mixer and the observations made while precipitating out waste in their own technologies, they developed a nano-scale iron to break down the pollutants into non-hazardous substances. This technology has been met with excitement from experts in remediation at NASA, other government agencies, and private industry. Testing is under way and a patent is pending.

While the termination of the comprehensive asbestos settlement was disappointing, it improves Crane Co.'s balance sheet and lowers interest expense; it also stretches out any cash flow obligations related to asbestos, and leaves the Company with greater near-term flexibility to conduct its business. Greater flexibility means Crane will be able to maintain a more aggressive acquisitions posture.

Fast and his senior management team continue to explore all available alternatives for handling the Company's asbestos liability. "We are encouraged to see increasing support in Washington for legislative reform," said Gus duPont, vice president, general counsel and secretary. "There is a growing consensus that asbestos litigation has brought our judicial system to the breaking point, and a legislative solution from Congress is essential."

THE ROAD AHEAD

Through a period of intense uncertainty, from the attacks of 9/11 through rising litigation and a shaky economy, Eric Fast maintained his agenda for transforming Crane Co. in the twenty-first century into a much more transparent, unified and customer-driven organization. "You can be at any unit now and find the same culture and the same operating systems," explained Fast. Putting his long financial background to good use, he has also shaken up the portfolio by edging out lower-return businesses as well as those lacking any affinity to other, larger segments. And by deploying Crane's strong free cash flow for acquisitions, existing businesses will only grow stronger in the days to come.

During the last 150 years, an epoch characterized by devastating global and civil wars, the rise and fall of nations and regimes, economic prosperity and stock market crashes, as well as extraordinary technological advancement, only a few American companies have thrived. In fact, in the *Fortune* 500, about one in ten U.S. businesses founded a century and a half ago (or earlier) continue to exist today. Like them, Crane Co. has demonstrated remarkable staying power, characterized by a willingness to embrace change, take risks, and sustain innovation even during the hardest of times.

What makes Crane unique is its unwavering commitment to the core values set in place in 1855, which set the standards for a small company whose landmark products helped fuel the American Industrial Revolution. Those values first expressed by R.T. Crane have continued to guide the actions of the men and women of this organization for a century and a half, and have proven to be even more relevant today. While the individual businesses they work for may be quite diverse, the people of Crane are linked together through shared values, shared tools, and a shared sense of pride in how they conduct their business. As it has throughout its history, the very structure of Crane's portfolio of businesses has changed dramatically, and today this will help people work even more closely together to achieve greater synergies.

"We have a vision," said Elise Kopczick, vice president of human resources who has been at Crane for twenty six years, "of constantly growing our people and providing them with extraordinary opportunities to excel in what they do. That's a fundamental part of our strategy going forward." Driving consistent, profitable growth across diverse busineses in a volatile world economy will require that everyone at Crane Co. fully embrace that vision. "We operate in a brutally competitive marketplace," said Fast, "and the only way that we can ensure that Crane will be here for the next 150 years is to stay true to our core values of uncompromising integrity and continuous improvement." Much will be demanded of everyone in the organization in years ahead. But R.T. Crane constantly challenged his workforce, and challenge has always brought out the best in the people of Crane Co.

A FEW OF THE MANY VOICES OF CRANE TODAY (FROM THE VIDEO *150 YEARS TOGETHER*)
Top row, left to right: Brad Ellis, group president, Merchandising Systems; Bill Hayes, president Xomox/Resistoflex; Edi Dirkes, manager, Employee Benefits, ELDEC ; Elise Kopczick, vice president, Human Resources. Second row, left to right: Helmwart Fülles, managing director, NRI; R.S. Evans, chairman of the board; Greg Ward, president, Crane Aerospace; Eric Fast, president and CEO. Third row, left to right: Paula Heiret, Lean black belt, Crane Aerospace; R.T. Crane, founder; Ray Boushie, retired group president, Crane Aerospace & Electronics; Johnnie Davis, director of Conroe Operations and Distribution, CVNA. Bottom row, left to right: Sascha Uebelher, marketing manager, Xomox, Europe; Rich Schueller, president, Kemlite; Will LaRusso, president, Polyflon; Kirk Kelhofer, president, Crane Valve Services.

CHRONOLOGY

the Company from 1855 to 2005

Painted wood model of the original foundry.

1855
On July 4, Richard Teller Crane (1832–1912) establishes the R.T. Crane Brass & Bell Foundry in Chicago.

A one-man show, R.T. Crane works as a molder, furnace tender, metal pourer, casting cleaner, and salesman for his own company.

Crane begins to supply engine parts for the emerging railroad industry and focuses his business on the specialized yet basic industrial area of fluid control.

R.T. Crane's brother Charles joins the Company and becomes a partner.

1856
The firm is renamed R.T. Crane & Brother.

1857
Crane enters the burgeoning steam-heating business and begins supplying wrought iron pipes and fittings.

1858
After hiring an expert in steam heat from New York, Crane wins its first large contract in this area—the new Cook County courthouse in Chicago.

The first Crane valves—made only of brass—are produced.

1861
Following the outbreak of Civil War, R.T. Crane & Brother becomes a major supplier to the U.S. government.

The Company adds an iron foundry and begins to expand manufacturing during the 1860s into fittings for saddlery, brass fittings, plates, knobs, spurs, and wagon equipment.

1865
Construction is completed on a larger manufacturing facility for Crane's two hundred employees at 10 North Jefferson Street in Chicago—the first malleable iron foundry west of Pittsburgh.

On February 14, R.T. Crane & Brother is incorporated in Chicago and changes its name to the North Western Manufacturing Company.

Manufacturing begins on a full line of industrial valves and fittings in cast iron, malleable iron, and brass.

1866
The first Company catalog offers such new products as fire hydrants, ventilating fans, a number of machine tools, and water pumps.

Crane is the first to manufacture an engine with a balanced piston valve as a substitute for the customary sliding valve.

1867
With elevators powered by steam during this era, Crane begins to produce freight elevators.

To improve elevator safety, Crane places a valve on its freight elevator engines so that when dangerous speeds were reached, the engine controlled the speed.

1870
Passenger elevator production begins at Crane.

The Company designs a steam-operated hoist for blast furnaces and for the next twenty-five years builds 95 percent of the hoists used in these furnaces in America.

1871
Upon the retirement of his brother Charles, R.T. Crane becomes the sole owner of the Company.

1872
Out of respect for his brother Charles, R.T. changes the name of the firm to Crane Brothers Manufacturing Company.

The Company begins to manufacture steam passenger elevators, and with the aid of specially designed valves, produces the finest hydraulic elevators of the era.

1873
Innovative mass-production technologies are developed and introduced at Crane, utilizing a steam-powered conveyer system of moving molds and pouring metal—the beginning of line production in foundries.

1874
The Company exits the steam-heating business.

1884
Crane takes over the business of a jobber in Omaha, Nebraska, which becomes the first branch office.

Total sales reach $1,807,233.42, even during a severe depression.

1886
Crane begins selling plumbing fixtures and trim.

The Crane Elevator Company is incorporated as a separate firm. It manufactures eleven different and innovative elevators, ranging from early steam and eventually electric passenger elevators.

A second branch office is opened in Los Angeles.

1887
Sales top $2 million.

1888
Crane establishes a metallurgical laboratory—believed to be the first in the Midwest. This allows the Company to produce iron castings of uniform tensile strength, a highly unusual manufacturing capability for this period.

1889
The Company operates four manufacturing facilities and employs more than fifteen hundred people.

1890
The name of the firm is officially changed to Crane Company on January 29 and becomes commonly known as Crane Co.

Between 1890 and 1910, Crane introduces a complete line of air brake equipment, full lines of pop safety valves and drainage fittings, a broad line of steam and oil separators, and a great variety of engineered specialty valves.

1893
Total sales top $5 million.

Crane exhibits its air brake equipment for locomotives at the World's Columbian Exposition in Chicago.

1895
The Crane Elevator Company is sold and becomes part of Otis Elevator Company.

Between 1895 and 1900, the Company starts the manufacturing practice of using gauges to check piping threads, and the American Society for Testing and Materials bases its standards on these early Crane procedures.

1900
At the Paris Exhibition, Crane wins the gold medal for its valves and fittings.

1903
Crane acquires the Eaton, Cole & Burnham Company in Bridgeport, Connecticut—an established valve and fitting manufacturer with a product line that parallels Crane's. The Bridgeport Works, as it is known, becomes the Crane Valve Company.

Sales top $18 million.

1904
Crane begins to manufacture agricultural machinery.

1905
A jubilee picnic is held for employees to celebrate the company's fiftieth anniversary.

1907
The German inventor Zenzes, who held patents on a small steel converter, is hired to help build a steel foundry for Crane.

Sales for the year are $32,151,904, and the Company declares a dividend of 35 percent on its stock.

1912
Founder R.T. Crane dies on January 8. His eldest son, Charles R. Crane, succeeds him as president.

Crane engineers publish several research papers on the effects of high temperatures on the properties of various metals, which form the definitive basis for subsequent metallurgical research.

The practice of tapping and gauging steel flanges, later recognized as the Pipe Thread Standard, originates at Crane.

A 160-acre site in Chicago is selected for a new, consolidated Crane plant; construction begins.

1914
Charles R. Crane sells his Company holdings to his brother R.T. Jr. and pursues a career in diplomacy.

Richard T. Crane, Jr., is elected president of the Company.

The Crane Fund is established as a private charitable trust to aid former employees (or their dependents) in need of assistance.

Crane completes construction of the "Great Works"—its first truly modern factory, run wholly on electricity.

Timekeeping check badge.

1915
Sales top $35 million.

R.T. Crane, Jr., establishes the Veteran League to honor employees with twenty-five years (or more) of continuous service.

1917
The Employee Group Life Insurance Plan is launched.

1918
Crane's first foreign manufacturing facility is opened in Montreal to produce iron and brass valves and fittings.

Canadian operations are incorporated as a separate company called Crane Limited.

A branch is established in Paris, France.

1919
Crane purchases E. Bennett & Son of London, one of England's largest distributors of valves and fittings, which operates as Crane-Bennett Ltd.

The Crane Export Corporation is established in New York City.

1920
Crane operates through eighty-six branches across the United States.

The Company decides to design and manufacture its own line of bathroom fixtures and to develop a much broader line.

1921
A large interest in Mutual Potteries Co. of Trenton, New Jersey, is acquired for the production of the new bathroom line.

1922
Sizable pottery and enamelware operations are purchased and built in Chattanooga and Trenton, and Crane begins producing its own bathroom line.

On January 20, stockholders vote to change the name of the company to Crane Co.

Cie Crane is established in France as a separate company.

1923
Crane Export opens an office in Shanghai.

1924
Expanding its marketing operations, Crane starts a traveling exhibit of its bathroom line housed in a fleet of specially built buses.

Trenton Potteries is fully acquired to expand manufacturing capacity for new bathroom line.

Foundry cast to commemorate 70th anniversary.

1925
A separate plumbing engineering department is organized.

Manufacturing operations are launched in England, producing a broad range of valves and fittings.

1926
The lavish $1 million showroom on the Atlantic City Boardwalk is opened and becomes the flagship of Crane's national marketing operations.

A plant is opened in Ipswich, England, to manufacture valves and fittings.

1928
Research activities expand to the extent that a separate building is constructed in Chicago for the engineering and metallurgical departments and test laboratories.

Crane introduces a line of color bathroom fixtures.

1929
Crane supplies bathroom fixtures, plumbing, valves, and piping to the giant Atlantic City Convention Hall, among other key buildings.

Manufacturing operations are launched in France (near Paris), producing a broad range of valves and fittings.

1930
Branch distribution operations increase to 190, with four national showrooms in the United States and three in Canada.

Two more manufacturing sites are opened in Canada.

1931
R.T. Crane, Jr., dies on his fifty-eighth birthday and bequeaths one hundred thousand shares of Crane stock to employees.

Following the stock market crash of 1929 and the onset of the Great Depression, the Company reports its first operating loss, which continues for the next two years.

John B. Berryman becomes president of Crane.

1935
Charles B. Nolte is elected president and John B. Berryman becomes chairman of the board (serving until 1941).

Noted American industrial designer Henry Dreyfuss begins designing bathroom fixtures for Crane Co.

CR
LISTED
NYSE

1936
Crane is listed on the New York Stock Exchange.

Department of Employee Relations is established.

1937
With all railing material supplied by Crane, the Golden Gate Bridge opens in San Francisco.

The Company consolidates research, development, and product engineering into the new Division of Engineering and Research.

1938
More than sixteen thousand men and women are producing some forty thousand different Crane items at eleven manufacturing facilities in the United States, Canada, England, and France.

1941
Sales exceed $100 million for the first time.

Following the death of Charles B. Nolte, John H. Collier is elected president of Crane.

1942
To meet demands of the U.S. Navy during World War II, Crane increases steel valve output capacity fourfold to twenty-five thousand tons annually, supplying naval vessels with between fifteen hundred and fifteen thousand valves per ship.

Crane publishes *The Flow of Fluids,* destined to become a classic guide to understanding the flow of fluids through valves, pipes, and fittings.

Crane provides valves and fittings and engineering consultants for the Manhattan Project at Oak Ridge, Tennessee.

1945
To meet wartime demand, Crane pioneers with steel alloys of various chromium, nickel, and molybdenum components to meet new requirements for corrosion resistance and high-temperature structural stability.

By the close of the war, Crane has received four Army-Navy "E" awards and one Maritime "M" award for excellence in wartime manufacturing.

1946
John L. Holloway becomes president of Crane, with John H. Collier serving as chairman of the board.

1951
A manufacturer of precision aircraft products, Hydro-Aire is acquired, and Crane begins to supply flow-control products for aircraft. A Burbank, California, company, Hydro-Aire was first organized in 1943. Its rocket propellant fuel control valves were used by all jet manufacturers.

A nonprofit corporation, the Crane Foundation is established to make charitable contributions for religious, educational, and scientific purposes.

1952
From test model specifications to final installations, Crane contributes to the development of the world's first nuclear submarine, the USS *Nautilus* SSN71, and supplies its first nuclear-grade valves to the U.S. Navy.

Crane supplies valves for the first nuclear merchantman, NS *Savannah*, and the first nuclear aircraft carrier, the USS *Enterprise*.

1953
Crane enters the residential heating business and becomes one of the first companies to introduce a practical heating unit for new ranch homes with low chimneys and no basement to house a boiler (low-stack heating units).

Hydro-Aire produces new fuel booster pumps and fuel transfer pumps for B-52s.

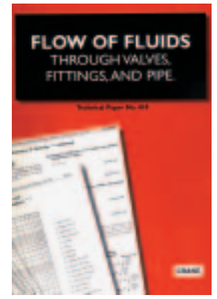
1954
Hydro-Aire's Hytrol antiskid braking system is selected as standard equipment for several U.S. military planes.

1955
Frank F. Elliott is elected president.

1956
"Tomorrowland" opens at Disneyland, with Crane Co. as a sponsor.

Crane manufactures and supplies gate valves for commercial nuclear power generators in the United States.

1957
Building on its *Flow of Fluids* handbook, Crane introduces *Technical Paper 410*, which becomes a classic on the dynamics of the flow of fluids through valves, pipes, and fittings.



The Monsanto "House of the Future" opens at Disneyland with Crane Co. participating.

Neele E. Stearns is elected president (as well as CEO in 1958) and Frank F. Elliott becomes chairman of the board.

1959
Thomas Mellon Evans is elected chairman of the board, and his new management philosophy leads to the streamlining of Crane's distribution network and a concentration on industrial manufacturing. Wesley Songer is elected president.

The Company's distribution operations are more profitable than manufacturing.

Originally founded in Boston in 1870, the assets of Chapman Valve Manufacturing of Indian Orchard, Massachusetts, are acquired.

1960
The assets of Cochrane Corporation of Philadelphia are purchased. A manufacturer of water-treatment equipment, Cochrane's history is full of firsts that revolutionized the industry, including the 1960 introduction of neutralization of wastewater by ion exchange as an alternative to large settling chambers.

Dante C. Fabiani is elected president.

Crane continues to expand into Canada and Europe, mainly through acquisitions of firms producing valves and boilers.

1961
Having steadily increased since 1959, Crane's worldwide manufacturing capacity is now up from thirteen plants to fifty plants. Truly a multinational operation, Crane has manufacturing operations in the United States, Canada, England, France, Italy, The Netherlands, and Mexico.

Crane acquires the assets of the Deming Company, a manufacturer of a complete line of pumps, packaged water systems, and accessories.

The acquisition of AllicanWare makes it possible for Crane to offer a complete line of plumbing products of its own manufacture.

Midwest joins Crane, bringing with it piping fabrication and erection expertise.

1962
Crane produces the world's largest two-part slide valve for a U.S. oil company's refinery. The valve tips the scales at fifty-two thousand pounds.

A valve plant is opened in Australia.

Hydro-Aire introduces the ultralight Air Turbine Driven Fuel Booster Pump in an industry for which weight is critically important.

Hydro-Aire's new Multiple Input Temperature Alarm system saves lives by warning pilots of excessive temperatures in the airplane's braking system.

1963
The new Kentucky pottery plant manufacturing vitreous china plumbing goes into operation.

Continuing its commitment to research and development, Crane constructs new engineering and laboratory facilities near Philadelphia.

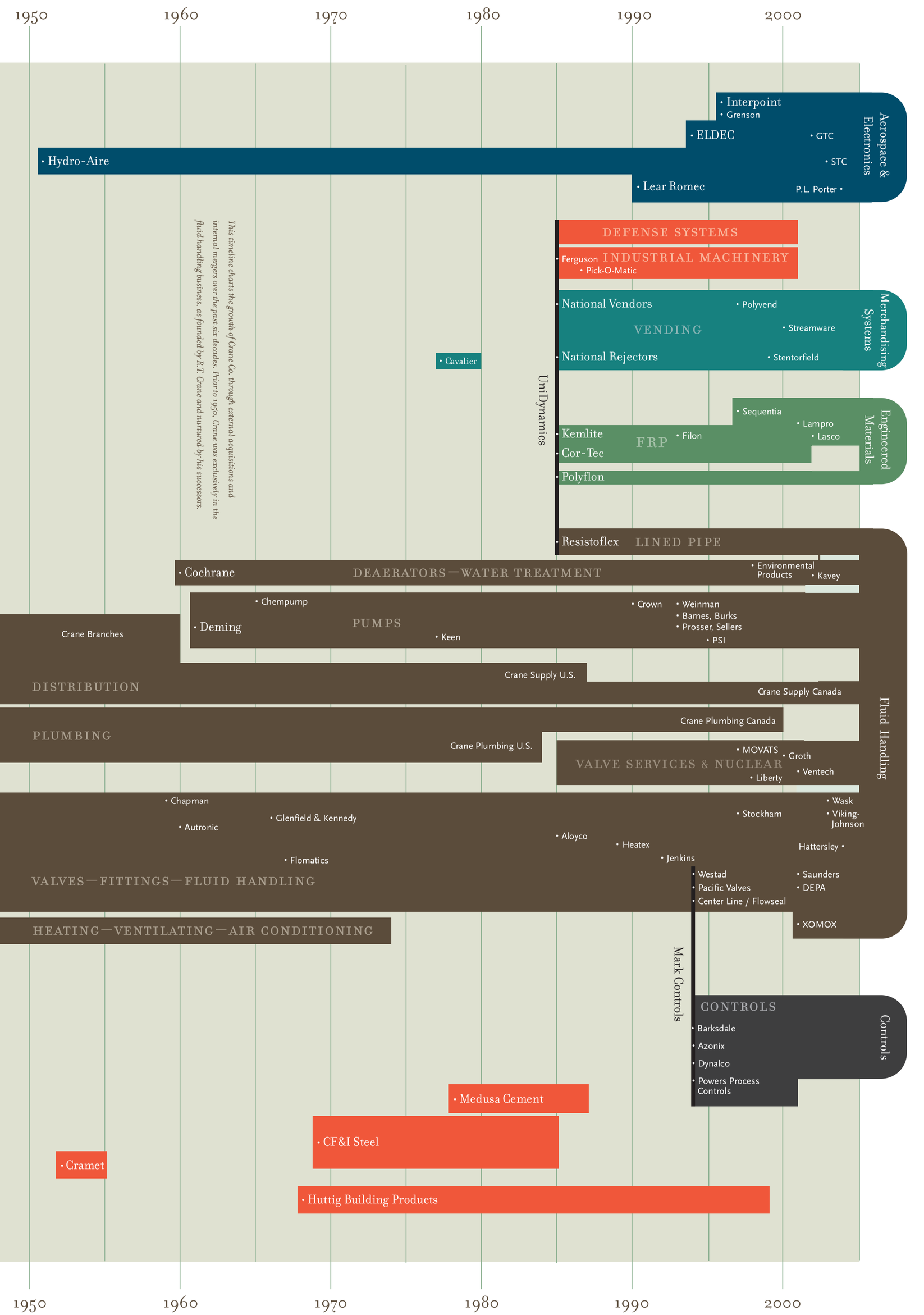
The new plant near Sydney, Australia, begins producing a variety of valves.

Crane-FISA, S.A., is formed when the Company acquires one of Spain's largest valve manufacturers.

Crane fabricates and erects piping and supplies stainless steel valves for a plant that will supply liquid hydrogen for the U.S. rocket program.

Crane produces the largest de-aerating system ever built (to date) for a food-processing firm's power plant.

The Broadway show *Never Too Late* features Crane plumbing onstage.


1950
1960
1970
1980
1990
2000
This timeline charts the growth of Crane Co. through external acquisitions and internal mergers over the past six decades. Prior to 1950, Crane was exclusively in the fluid handling business, as founded by R.T. Crane and nurtured by his successors.
Aerospace & Electronics
• Interpoint
• Grenson
• ELDEC
• GTC
• Hydro-Aire
• STC
• Lear Romec
P.L. Porter •
DEFENSE SYSTEMS
• Ferguson
INDUSTRIAL MACHINERY
• Pick-O-Matic
Merchandising Systems
• National Vendors
• Polyvend
VENDING
• Streamware
• Cavalier
• National Rejectors
• Stentorfield
UniDynamics
Engineered Materials
• Sequentia
• Lampro
• Kemlite
• Filon
FRP
• Lasco
• Cor-Tec
• Polyflon
• Resistoflex
LINED PIPE
Fluid Handling
• Cochrane
DEAERATORS—WATER TREATMENT
• Environmental Products
• Kavey
• Chempump
• Crown
• Weinman
• Barnes, Burks
• Prosser, Sellers
Crane Branches
• Deming
PUMPS
• Keen
• PSI
Crane Supply U.S.
DISTRIBUTION
Crane Supply Canada
Crane Plumbing Canada
PLUMBING
Crane Plumbing U.S.
• MOVATS
• Groth
VALVE SERVICES & NUCLEAR
• Ventech
• Liberty
• Chapman
• Wask
• Stockham
• Glenfield & Kennedy
• Viking-Johnson
• Autronic
• Aloyco
• Heatex
Hattersley •
• Flomatics
• Jenkins
VALVES—FITTINGS—FLUID HANDLING
• Westad
• Saunders
• Pacific Valves
• DEPA
• Center Line / Flowseal
• XOMOX
HEATING—VENTILATING—AIR CONDITIONING
Mark Controls
Controls
CONTROLS
• Barksdale
• Azonix
• Dynalco
• Powers Process Controls
• Medusa Cement
• CF&I Steel
• Cramet
• Huttig Building Products

1964
For the Tennessee Valley Authority's Bull Run, Tennessee, power-generation station, Crane makes high-pressure stop-check valves to provide the lowest pressure drop ever achieved in this era in globe-type valves.

Electrotube, a revolutionary hydronic electrical baseboard heating system, is introduced.

Hydro-Aire develops a new line of liquid coolant pump packages to meet the special needs of the environmental-control and life-support systems of space capsules.

Hydro-Aire's "clean room" with set atmospheric conditions goes into operation.

New Cochrane headquarters are dedicated in King of Prussia, Pennsylvania.

1965
Cochrane's pioneering Cyclone Fcam Breaker at the sewage reclaiming plant for the Borough of Lonsdale, Pennsylvania, enables it to save and purify more than 250,000 gallons of water a day.

The assets of the Chempump division of Fostoria Corporation are acquired, a small but highly specialized fluid-control company.

Crane introduces a new line of compact kitchens with clean, straight edges and a number of unit configurations for space-constrained areas.

Safety-conscious Crane launches a full line of cast-iron bathtubs with full-width, slip-resistant bottom surfaces.

1966
Crane receives a U.S. Department of the Interior contract to investigate methods for the pretreatment of brackish water to improve the economics of desalination by electrodialysis procedures.

Crane is the first to incorporate safety ideas recommended in a landmark Cornell University study on the bathroom.

Crane Limited, the UK subsidiary, purchases a majority interest in Scottish-based Glenfield & Kennedy Holdings Limited, an innovator in flow-control systems and equipment.

1967
Crane receives a multimillion-dollar contract from Boeing for Hytrol systems on the new 747 aircraft.

Crane acquires Flomatics to gain expertise in control valves that are widely used in cryogenic and industrial service and the aerospace industry.

Crane Ltd. supplies a large range of valves for the new *Queen Elizabeth II* ocean liner.

Chempump's new metering pump line offers the chemical industry a leakproof diaphragm design that vastly improves liquid metering accuracy and requires 40 percent less horsepower to operate.

Crane introduces eleven new sizes of vertical in-line pumps that can be installed along a pipeline like a valve.

Crane's breakthrough Ammonex Process® increases the effectiveness of demineralizers in electric utilities.

The U.S. Federal Water Pollution Control Agency awards Crane a contract for a combined installation of microstaining, ozonation, and chlorination units in Philadelphia.

1968
Flomatics introduces a versatile line of high-performance control valves with modular interchangeable parts—reducing engineering and assembly time.

The increase in offshore petroleum extraction leads Crane to establish a special group to coordinate and expand Crane's technical product skills in this market.

1969
Crane buys a majority stock interest in CF&I Steel Corporation, a manufacturer of a variety of steel products used in the construction, petroleum, mining, metal-working, transportation, farming, and ranching markets. It also brings coal, iron ore, and limestone deposits as well as substantial land-holdings.

Crane makes an agreement with La Compagnie des Eaux et de l'Ozone for exclusive U.S. representation of the Otto Process, an ozonation system that not only eliminates contaminates from water, but also improves its color and taste.

Crane pumps play an integral part in the *Apollo* moon landing, especially as instrumental and environmental cooling systems on the lunar module that set astronauts Armstrong and Aldrin on the moon's surface. Hydro-Aire and Chempump pumps are used in other *Apollo* and *Gemini* space missions.

Crane Chempump truck.

1970
To expand its activities in the fight against pollution, Crane forms an Environmental Systems Division that includes the Cochrane operation. It designs and builds the world's largest microstrainer for the Chicago Metropolitan Sanitary District—the first of its kind in a major city.

Through its Valves and Fittings Division, Crane remains a leading manufacturer of nuclear valves and fittings for the power industry and naval applications.

Flomatics develops a nylon extrusion valve for textile fiber plants.

CF&I Steel Corporation, a major supplier to the Rocky Mountain area, supplies rails for the Bay Area Rapid Transit System (BART).

In cooperation with Boeing, Hydro-Aire develops and demonstrates the first fully automatic braking and skid-control system for jet engines.

Hydro-Aire introduces an online maintenance system for in-flight monitoring of aircraft systems.

1971
Sales reflect the fact that almost every major American city has approved Crane water meters.

CF&I installs equipment for the production of heat-treated dozer and scraper blades, allowing Crane to enter the market for cutting edges used on heavy-construction earth-moving equipment.

Crane becomes the first U.S. manufacturer to receive the newly implemented "N" certification from the American Society of Mechanical Engineers for the manufacture of valves for nuclear applications.

1972
CF&I rails are used exclusively in the construction of the highest voltage electrical system in the world to date.

Hytrol Mark II automatic brake control system is introduced.

1973
A new Crane electronic position-indicating system for subsea oil wells allows the drilling crew to determine the position of the blow-off preventer valve. This facilitates drilling and helps avoid oil spills.

Crane introduces a line of fiberglass shower and tub wall units.

Hydro-Aire combines light aircraft brake experience with Hytrol® antiskid technology to offer a new braking system for light jet and turboprop aircraft.

1974
Hydro-Aire develops a new wheels-rolling and takeoff monitor for large, multi-wheel aircraft that monitors the performance of wheels and brakes during takeoff and notifies personnel of potential problems.

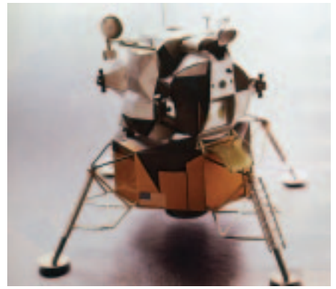
Crane sells its heating business.

Sales exceed $1 billion for the first time.

1975
CF&I introduces a new sixteen-inch tie plate for use on high-performance rail tracks.

Invermotor fuel pump gains certification; it provides up to ten times the life and reliability of other general aviation and commuter-class fuel pumps in use.

Huttig Sash & Door introduces a new line of insulated window units.



Three Crane pumps were used in the environmental control system of the lunar module.

1976
With engineering and production capabilities to meet virtually any solids handling application, Deming completes development of large solids handling pumps, adding six new sizes to the line.

Hydro-Aire's research focus on developing microminiaturized components for its electronic systems begins to pay off: these systems are now used in the invermotor fuel pump and automatic braking and skid-control systems. These systems are far more demanding than conventional electronics but provide greater reliability.

1977
Crane acquires a line of high-quality small sewage pumps for residential and light commercial use, enabling the Company to serve markets from the smallest domestic needs to large municipal and industrial fluid waste applications.

Cochrane introduces a comprehensive line of fluid-monitoring systems as part of its development of specialized fluid and pollution control systems.

The first NASA space shuttle (*Enterprise*) is flown in test flights and relies on Hydro-Aire automatic brake controls.

Classic Home Products Division is formed to serve the growing do-it-yourself (DIY) market.

1978
Crane makes a substantial investment in Medusa Corporation—a major producer of cement and aggregates.

Crane introduces several new butterfly and bronze valve lines for commercial and industrial applications.

In plumbing, Crane introduces a complete line of washerless faucets and a countertop lavatory with Crane's exclusive Cush-N-Seal® that provides a water-tight joint without sealing compounds.

1979
Boeing chooses Hydro-Aire's new all-digital Mark IV® automatic braking control system for its 757 and 767 airplanes.

1980
Robert J. Slater is elected president.

Huttig Sash & Door Company continues to respond to DIY needs with the introduction of a complete packaged insulated glass replacement window.

To respond even more rapidly to customers, Crane installs minicomputer systems in all sales, distribution, and manufacturing locations.

1981
The Valve Division responds to its fluid-control customers' needs with new quarter-turn valves.

To streamline customer service, Crane continues to computerize its facilities—especially at Medusa Corporation.

Crane provides the braking system for the *Columbia* space shuttle's first voyage into space.

1982
Cessna Citation III completes certification with Hydro-Aire brake controls and fuel pump equipment.

Crane Canada introduces several new acrylic plumbing features.

1983
Crane delivers the first braking control equipment for the new "commuter aircraft" group—including de Havilland DHC-8 and Saab-Fairchild 340.

1984
Thomas M. Evans resigns as chairman of the board after serving Crane for twenty-five years. His son, Robert S. Evans, is elected chairman and CEO.

The Company announces a new strategic plan to build on its strength in special light-to-medium manufacturing and wholesaling distribution and to reduce its reliance on capital-intensive, cyclical, and commodity-oriented businesses that are facing increased competition and worldwide overcapacity.

As part of its new business strategy, Crane sells its U.S. plumbing operations.

Crane shows its commitment to research and development and streamlining processes by installing a computer-aided design and drafting facility.

Bronze medallion minted to commemorate the 130th anniversary in 1985.

1985
Crane acquires UniDynamics, which holds a strong position in specialized manufacturing, especially defense-engineered materials. Through this acquisition, a number of new businesses come on board, including Kemlite, a manufacturer of fiberglass-reinforced plastic (frp) panels, which is destined to become one of Crane's largest business units. Other companies acquired through the Uni-Dynamics merger include lined pipe manufacturer Resistoflex and National Vendors, a leading producer of automatic merchandising equipment for use by vending food-service operators in the United States, Canada, and Europe.

Aloyco (the leading stainless steel valve manufacturer) is acquired, augmenting Crane's strength in corrosion-resistant fluid handling.

Crane purchases the valve service business of Mark Controls, giving Crane the largest nationwide valve repair business in the United States.

Crane acquires Valve Systems and Controls from Gulf Consolidated to further its capabilities in quarter-turned automated valves and fluid systems.

Hydro-Aire wins the brake control contract on the upgrade program for the Grumman A-6F Intruder plane.

Crane Co. is incorporated in Delaware.

1986
Hydro-Aire wins the contract for the Boeing 747-400 brakes and continues to lead the field by designing new concepts in fiber-optic sensing and advanced digital electronics for future aircraft.

UniDynamics/Midwest designs special doors, cranes, and hoists for U.S. Navy LDH-1 amphibious assault ships.

Dyrotech (Kemlite) designs a new smooth, specially formulated fiberglass-reinforced panel for an "automotive" appearance.

National Vendors enters the office service market with the completely redesigned Refreshtron line.

1987
UniDynamics/Midwest and Crane Midwest Fittings consolidate. The new Crane Midwest manufactures such equipment as cargo and personnel elevators, cranes, hoists, boat davits, special-duty winches and special welding fittings used in power plants, pipeline projects, and U.S. Navy nuclear propulsion systems.

Crane introduces package conveyors and ammunition-handling equipment for DDG-51 class destroyers.

Hydro-Aire wins the contract to supply the antiskid-control and brake-temperature monitoring systems for the new McDonnell Douglas C-17 military transport.

1988
Chempump introduces a new magnetic drive seal-less pump and line of self-priming leakproof pumps.

National Vendors introduces a coffeemaker that individually brews each cup of coffee, starting with the bean.

Polyflon (acquired through the merger with UniDynamics) stakes a position in the magnetic resonance imaging market through the manufacture of microwave substrate materials and high-voltage, high-frequency capacitors.

UniDynamics/Phoenix is involved in advanced aerospace and defense initiatives, such as Trident D-5 and Cruise missiles.

1989
Chempump acquires the canned-motor pump operations of Dresser Industries' Pacific Pump Division.

Deming, which serves the clean and dirty water segments, develops a new pump that has a liquid-locking feature that prevents surface leakage and environmental contaminants.

1990
Crane acquires Lear Romec Corporation, a manufacturer of pumps for the aerospace industry, thus expanding Hydro-Aire's capabilities in this field.

Crane Environmental Systems, which designs equipment for treating water and wastewater, acquires the parts and services business of Belco Water and Waste Water Treatment. This gives Crane a more complete service to offer its environmental customers.

1991
B. Jack Barnes is elected president.

Hydro-Aire supplies the antiskid braking system of the new Boeing 777.

National Vendors receives a large contract with the U.S. Postal Service and also with Japan, the world's largest vending market.

Kemlite's translucent roof panel is a hit with truck fleets.

1992
Chempump is the only U.S. manufacturer of both seal-less canned-motor and magnetic drive pumps designed to handle environmentally hazardous fluids.

1993
The acquisition of Filon, a manufacturer of fiberglass-reinforced plastic panels, secures Kemlite's position as the leading fiberglass panel supplier to the recreational vehicle market.

Crane acquires Burke Pumps Inc., a manufacturer of engineered pumps. This acquisition complements Chempump's and Deming's business and expands Crane's ability to serve niche markets.

The Resistoflex "Flying R."

1994
Hydro-Aire continues its 100 percent win rate on all new antiskid braking programs with several new contracts.

Resistoflex, a maker of corrosion-resistant PTFE (polytetrafluoroethylene) plastic-lined pipes and fittings introduces IsoBend, a specialty piping system that reduces the number of flanges needed in a pipe run.

IsoBend is a 1994 Plant Engineer Product of the Year finalist.

Resistoflex wins the largest U.S. PTFE-lined pipe contract in history (awarded by Hoffman-La-Roche).

Mark Controls is acquired, bringing to Crane the Flowseal, Center Line, and Pacific Valves products, and the Barksdale, Azonix, Dynalco, and Powers Process controls businesses.

ELDEC Corp., a manufacturer of electronic and electro-mechanical aircraft systems in Lynnwood, Washington, is acquired.

Crane-Aloyco becomes Crane Valves Nuclear Operations, establishing a customer-driven, customer-focused organization.

Cast Crane logo.

1995
Crane establishes a joint venture in China to produce iron valves for distribution through the Company's global network.

Chempump introduces a series of pumps that permit continuous monitoring of critical pump operating parameters.

The first Rolls Royce Tent engine using a Lear Romec lube and scavenge pump is put in service.

L. Hill Clark is elected president.

1996
Crane acquires the microelectronics business of Interpoint Corporation, expanding ELDEC's capability to provide power-conversion products for the aircraft and aerospace industries.

Crane acquires Grenson Electronics, a UK company that designs and produces custom low-voltage power-conversion devices for aerospace, defense, and other industries.

Crane introduces a new valve for liquid natural gas.

New low-pressure sewer pump products serve alternative sewage collection markets.

CorTec successfully introduces Encor® lightweight foam core composite panels for specialty trailers.

National Vendors launches an initiative to manufacture brand-specific snack machines in partnership with prominent snack and candy companies.

1997
For the first time, the Company generates sales of more than $2 billion and net earnings in excess of $100 million.

Kemlite acquires the transportation products business of Sequentia, creating a more complete line that includes liner panels for truck bodies, trailers, and containers.

Crane acquires the various operations and product lines of Stockham Valves & Fittings, Inc., increasing Crane's bronze and iron volumes.

ELDEC wins orders for its proximity sensing systems or power systems on almost all the new aircraft launched during the year.

MOVATS, Inc., is acquired from Westinghouse Electric Corporation, adding on-site valve and actuator diagnostics, maintenance, and repair services to provide its nuclear customer base a full range of valve products and services.

Crane launches its Operational Excellence (OpEx) system and graduates its first class of black belts trained in Six Sigma methods.

1998
Resistoflex acquires Dow Chemical's Plastic-Lined Piping Products division, gaining a broader line of fluoropolymer- and thermoplastic-lined piping systems for chemical processing high-purity, defense, and water-treatment applications.

Crane acquires Environmental Products, a maker of packaged, membrane-based water-purification systems, expanding the Company's offerings to the water-treatment industry.

Crane Valves Nuclear Operations and Crane MOVATS become Crane Nuclear, Inc., establishing headquarters in Kennesaw, Georgia.

Stentorfield, Ltd., the UK-based hot-and-cold-drinks equipment manufacturer, is acquired.

Liberty Technologies is acquired, bringing nuclear valve monitoring products and repair capabilities to Crane's nuclear valve business. Its motor, engine, and compressor monitoring products are added to Dynalco Controls.

1999
Eric C. Fast is elected president.

Kemlite successfully introduces Medallion—a new fiber-free, higher-gloss panel for the recreational vehicle market.

Crane introduces new fluid-handling products, including a triple-offset rotary valve for high-pressure, high-temperature applications in power plants and hydrocarbon production and two series of butterfly valves for the food and beverage industries.

Huttig Sash & Door is spun off to shareholders.

1942 Crane calendar.

2000
Hydro-Aire's large installed base on Boeing airplanes enables it to offer aftermarket services in repair and overhaul.

Hydro-Aire and ELDEC (Crane Aerospace's largest business) serve the smaller, regional jet market.

ELDEC is honored with Embraer's Best Suppliers Award—2000.

The Groth Corporation's Valve Repair Division is acquired, expanding capabilities in the Houston, Texas, market—the largest valve service market in North America, supplying the oil, gas, and petrochemical industries.

Cochrane Division is reorganized as Crane Environmental, Inc.

2001
Eric C. Fast is elected CEO (in addition to president), and Robert S. Evans continues as chairman of the board.

Crane completes a series of divestitures (including Crane Plumbing and Powers Process) and "internal acquisitions" to strategically link a smaller number of larger business units within the organization.

Crane acquires Xomox (the valve business of Emerson), expanding into the global marketplace with high-end application-driven valve brands.

Saunders is acquired and renamed Crane Process Flow. With the acquisition of Saunders and Xomox, Crane's position in the rapidly consolidating global valve industry is significantly strengthened.

National Rejectors adapts vending machines to accept the new euro.

Ventech Controls, Inc., of Houston, is acquired, and the UK-based Laminated Profiles Ltd. is acquired and folded into Kemlite.

2002
The acquisition of Lasco Composites LP gives Kemlite an important presence in the industrial market for frp panels.

The acquisition of General Technology Corporation, which provides customized manufacturing services focused on military and defense applications, strengthens Crane's microelectronics manufacturing capabilities.

Crane Aerospace acquires the assets of Trinity Airweighs, a producer of automated weight and balance technologies.

Corva Corporation joins Crane, further expanding valve product offerings and actuator capabilities.

Crane Co. expands the capabilities of the ValveWatch® ESD Valve Monitoring System to include emergency shutdown valve leakage prediction.

2003
Crane acquires Signal Technology Group, a manufacturer of highly engineered, state-of-the-art power-management products and electronic radio- and microwave-frequency components and subsystems for the defense, space, and military communications markets.

Kemlite introduces ETR, a highly tear-resistant, translucent roof panel that is gaining market share against aluminum.

2004
Crane completes $50 million in acquisitions, purchasing the P.L. Porter seat actuation business for the Aerospace Group, and the Hattersley valve brand for the Fluid Handling segment.

Crane Co. announces a comprehensive settlement of its asbestos litigation but is forced to terminate the transaction due to the curtailment of the availability and scope of relief by the U.S. Court of Appeals for the Third Circuit, in the Combustion Engineering case. As a result, Crane returns to the tort system to resolve the asbestos claims and is exploring all available alternatives for handling this liability.

2005
Crane Co. celebrates its 150th anniversary throughout the year in every location worldwide with shared values, shared pride, and shared history.

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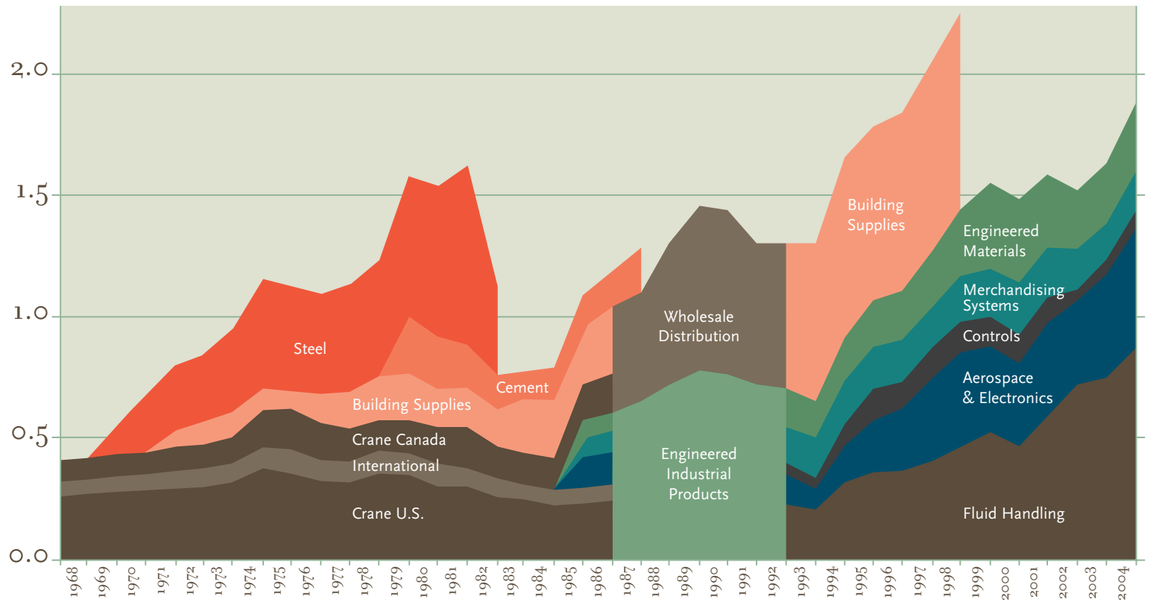
Early Crane delivery truck.

CRANE CO. ANNUAL REVENUE *(in $billions)*



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The major portion of the text was written by Patricia Watson, Ph.D., of the Business History Group in Columbia, Maryland. In addition to researching and writing the chapter text, Patricia also interviewed past and present Crane employees, engaged in picture research at the Chicago Historical Society, and compiled the complete chronology that appears at the end of the book.

Karen Salsgiver of Salsgiver Coveney Associates, Inc., in Westport, Connecticut, was responsible for the book's design, typesetting, and production, as well as for the art direction of the photography. Karen also interviewed past and present Crane employees, provided ongoing editorial input, engaged in a year-long review of Crane's archival materials, and she researched and wrote all of the innovations, values, and photo captions.

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COLOPHON

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