

Footprints

A publication of the Howard County Historical Society

Volume 1, Issue 3

August 2012



**Looking back
at Haynes
International
The first 100 years**

**Six to be inducted
into Howard County
Hall of Legends**

PHOTO COURTESY OF HAYNES INTERNATIONAL

Happy Birthday Haynes International

In this issue of *Footprints*, we take a look at Haynes International, which will celebrate its 100th birthday this year.

One hundred years in business is impressive for any company. Times change and so does the economy. But Haynes International and its alloys have evolved with the times and continued to find markets when other companies have failed.

And what interesting markets they have found!

Haynes products went to the moon. The alloys were used in every Apollo flight, as well as those of every space shuttle.

Haynes alloys have also been used for commercial and military aircrafts. They were even used in the valves of the planes flown by Amelia Earhart and Charles Lindbergh.

When the extensive restoration of the Statue of Liberty took place in 1983, it was a Haynes alloy that was used for the internal support of the statue.

These locally produced alloys have also been used in drug manufacturing, dental restorations, oil drilling equipment, scalpels and much more.

Four men have extensively researched the history of Haynes for the 100th anniversary. In this issue, we bring you a part of their research into how a Kokomo inventor, known mostly for his inventions of the first car and stainless steel, started a small business in 1912 that grew into a company with a vision that extends well into the 21st century.

In this issue, we also will look at the impressive individuals with local roots who are the 2012 inductees into the Howard County Hall of Legends, as well as the young interns who have assisted in the many tasks underway at the Howard County Historical Society.

Enjoy!

Emily West
Footprints Editor

In this issue:

- 3 Hall of Legends**
- 3 Members contest**
- 6 Summer interns
a blessing at
HCHS**
- 7 'Fueling a Re-
gion: Indiana's
Gas Boom'**
- 8 100 years
of Haynes
International**
- 15 Membership**

Upcoming events

- ♦ Aug. 17 — Hall of Legends at Casa Bella Room of Pastarrific Italian Restaurant, 3001 S. Webster St. in Kokomo. Reception at 6 p.m., and dinner will follow at 7 p.m. Tickets are \$40 per person.
- ♦ Aug. 29 — Special screening of "Fueling a Region: Indiana's Gas Boom" at 6 p.m. and 7 p.m. at the Elliott House. Seating is limited to 25 per screening. So, please call the historical society at 452-4314 for reservations.
- ♦ Sept. 15 and 16 — Koh-Koh-Mah/Foster Encampment
- ♦ Oct. 16 — Howard County Historical Society annual meeting. Haynes International will be the program.

Volunteers needed

Take a step back in time, and help the historical society, too. This year, the HCHS once again will be at the Koh-Koh-Mah/Foster Living History Encampment on September 15 and 16, just west of Kokomo. Volunteers are needed to help with candle-dipping activities and to serve corn-on-the-cob. For more information or to volunteer, call the historical society at 452-4314. Dress up in a period costume and join the fun.

From the executive director

Legends take root here, can bloom anywhere

Community leaders and media commentators talk about the “brain drain” and the challenge of keeping our young people here in the county. While that’s a concern for the community (and me as a parent), it’s probably an oversimplification.

Perhaps, as we send our sons and daughters out into the world, it’s as if we’re blowing little dandelion seeds into the wind, and they’re sprouting up as roses all over the world.

One of them landed in Massachusetts and created a series of beloved children’s books. Another blew into Chicago on the way to California and left a legacy of innovative artwork and hundreds of students. Others grew into accomplished journalists and commentators, actors, a general, an admiral, business leaders, a rocket scientist and a musician. Those who live less public lives started construction companies, ran newspapers and became biochemists, computer programmers and graphic designers. One of them worked on top secret

military projects at Delco, started a radio station and gave me my first real job. Some, like Elwood Haynes and George Kingston, put down roots and changed the world from right here in Indiana.

The Hall of Legends was created to recognize some of the roses that have spread from Howard County and to memorialize their lives and stories in the collections and archives of the historical society. Its most important role, though, is as a benchmark of excellence for our young people. Parents and teachers, use the Legends to encourage high standards and excellence. Look at the honorees, learn their stories, and understand that you don’t have to come from big cities or major universities to make your mark.

Whether your rose blooms in a small Indiana town or far and away from there, you can make a difference.

Dave Broman
HCHS Executive Director

HOWARD COUNTY HISTORICAL SOCIETY

MEMBERSHIP CONTEST

The contest runs from July 15 - August 31, 2012, and is open to members in good standing. Tell your friends about the historical society, the museum, the mansion, whatever you like best about the society’s programs, and ask them to become members. The person who enrolls the largest number of new members wins, and ties will be broken by random drawing. See the full rules at howardcounty-museum.org or request a printed copy at the museum or society office. Call 452-4314 for copies of the membership brochure to distribute, or stop by and pick up a few.

Share your passion for Howard County history, support the museum and archives, and win dinner for four at the Half Moon Restaurant in Kokomo!

See us (and “like” us!) on Facebook at facebook.com/hchistory, also on Pinterest at pinterest.com/hchistory, and on LinkedIn and Google+

Celebrating local legends

The Howard County Historical Society will celebrate the accomplishments of the 2012 class of Howard County's Hall of Legends during an evening of fine dining, fun and history.

The Hall of Legends banquet and induction ceremonies will take place in the Casa Bella Room of Pastarific Italian Restaurant, 3001 S. Webster St. in Kokomo, on Aug. 17.

The evening will begin with a reception at 6 p.m., and dinner will follow at 7 p.m. Tickets are \$40 per person and may be purchased at howardcountymuseum.org or at the Howard County Historical Society office. Office hours are 9 a.m. to 4 p.m. Tuesday through Friday, or call 765-452-4314.

The following are the 2012 inductees:

George Kingston invented the Kingston Carburetor in 1902 and founded the company that became Kingston Products. He was also involved in Kokomo Electric Company, which produced ignition coils and plugs for automotive combustion engines, and Kokomo Brass Company. His companies produced automotive parts and accessories, appliances, and a famous line of toys. Kingston's company was heavily involved in military production during World War II. He's also known as the owner and primary resident of Kokomo's Seiberling Mansion, now home of the Howard County Museum.



George Kingston



F. S. Badger

F. S. Badger was metallurgist and vice president of research and development for Stellite in Kokomo, a division of Union Carbide. Badger was involved in most of the major events and decisions that shaped Stellite, now Haynes International. He was responsible for the company's investment in casting processes, which

produced critical turbocharger parts for aircraft used in World War II. The extremely durable, high-temperature metal castings allowed production of aircraft engines that could fly at greater altitudes over longer distances and contributed greatly to American air superiority over Europe, as well as the safety of American airmen. Badger also developed the company's line of wrought alloy products and the creation of the alloy research facility in Kokomo.

Major General Ed Trobaugh was a 1955 graduate of West Point. He worked in a series of assignments during his career, culminating in the position of Deputy Commanding General of the Fifth US Army at Fort Sam Houston. He also served as Commanding General of the



Major General Ed Trobaugh

82nd Airborne Division at Fort Bragg, during which time he led the 1983 invasion of Grenada. Trobaugh served one tour in Korea and two in Viet Nam. His decorations include the Army Distinguished Service Medal, Silver Star, Purple Heart, Bronze Star, and Air Medal with Parachutist and Pathfinder Badges.

Dr. Emily Craig is a forensic pathologist and renowned expert on bone evidence in death investigations. She provides expert consultation in the identification of remains and has testified as a forensic expert in numerous court cases. She has worked on the scene of numerous crimes and tragedies, including the World Trade Center, the Murrah Federal Building in Oklahoma City and the Branch Davidian Compound in Waco, Texas. She is presently associated with the National Missing and



Dr. Emily Craig

Unidentified Person System and is the author of *Teasing Secrets From The Dead: My Investigations At America's Most Infamous Crime Scenes*. She has been profiled on television shows, including *America's Most Wanted*, *Cold Case Files*, *The New Detectives*, *Unsolved Mysteries* and *48 Hours*.

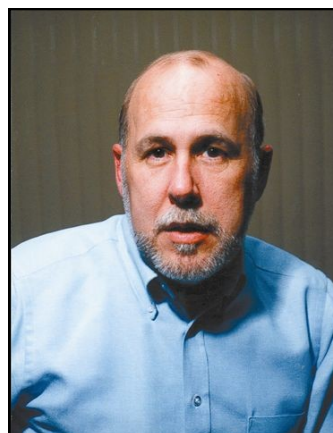
Sam Allen is chairman and chief executive officer of Deere & Company, chairman of the Council On Competitiveness and a member of

the board of Whirlpool Corporation. Allen joined John Deere in 1975 after graduating from Purdue, and worked his way through a series of assignments with positions of increasing responsibility. Before his promotion to CEO, Allen was president of the Worldwide Construction and Forestry Division of Deere & Company. He was responsible for the company's intelligent mobile equipment technologies and for Deere's advanced technology and engineering.



Sam Allen

Kenny Hill retired in 2003 as a UAW international representative, a position he held after serving as president of UAW Local 685. His role in union leadership began in 1979, and he was active in bringing about the quality initiatives that saved Chrysler in the 1980s. Beginning in 1990 as president of Local 685, he played a key leadership role in the successful negotiations that brought the first Indiana Transmission Plant and ITP2 to Kokomo.



Kenny Hill

Summer volunteers are greatly appreciated

By Bonnie Van Kley
Curator of Archives

This summer we have been blessed with four women who are volunteering in the archives.

Alyson Goldner attended Ball State University and is currently a junior majoring in history at IU Kokomo. She began the summer by driving from Indianapolis each day, but now she has an apartment in Kokomo and is taking a summer class at IUK. On her volunteer information form she wrote that her special skills are singing and neat handwriting and that she LOVES organizing. Alyson is learning how to use PastPerfect and is here all day on Tuesday and Thursday doing a lot of what she loves to do while processing the Haworth High

School Collection as well as other collections in the archives.

Abby Rolland is a sophomore at Gettysburg College in Gettysburg, Pennsylvania, and her areas of interest are history and political science. Abby is a U. S. history buff. If you give her a year, she is able to tell you who the president and first lady were then and also tell you details about each person. One of her special skills is being attentive to detail, and it is serving her well while she is working in the archives on Thursday mornings organizing collections and labeling folders. Abby is also helping Stew and Jaclyn with three-dimensional artifacts on Tuesday mornings.

Continued on next page



Summer volunteers Alyson Goldner, Abby Rolland, Lilli Elliott and Taylor Nichols have helped to eliminate the number of archive collections waiting to be processed.

'Fueling a Region: Indiana's Gas Boom'

August 29 at 6 p.m. and 7 p.m. in the Elliott House

Coal miners thought they had reached the ceiling of hell in 1876 near Eaton, Indiana. The sound and smell scared them so badly that they stopped drilling, plugged up the mine and abandoned it.

After the true nature of their discovery became apparent in the mid-1880s, the flaming torches — "flambeaux" — that many communities flaunted might have led some to think they were actually in that notorious hot place.

The burning flambeaux were fueled by natural gas from one of the largest and most accessible gas fields ever discovered. It was a gas boom, and it changed Indiana in ways that we're only beginning to fully appreciate. The most visible results are the famous glass and automotive industries in Howard County, but the profligate waste of the gas left a legacy, too.

Members of the Howard County Historical Society are invited to a special member-only screening of "Fueling a Region: Indiana's Gas Boom" on August 29. The program was produced by WIPB, the PBS-TV affiliate in Muncie, in cooperation with the Hamilton County Convention and Visitors Bureau and was filmed and edited by students at Ball State University. Many of the photographs for the program were provided by the Howard County Historical Society, and the camera crews spent several days shooting video in Kokomo — most notably at Kokomo Opalescent Glass.

Members may attend either of two screenings, 6 p.m. or 7 p.m., on August 29 in the Elliott House. Seating is limited to 25 per screening. Please call the historical society at 452-4314 for reservations.

Summer volunteers, *continued from page 6*

Lilli Elliott volunteered in the archives last summer and came back for more this year. She graduated from DePauw University this spring with a degree in art history and has submitted an application for an internship to several museums in the Chicago area. Lilli is a good writer, and one of her hobbies is history. So, she is in the right place! Last summer she learned how to sort and organize a collection. On Tuesday and Thursday mornings she has helped organize the Haworth High School Collection and will be processing other collections that are in the archives waiting for attention. Lilli is also a volunteer hostess in the mansion.

Taylor Nichols is from West Lafayette and will be a senior this fall at Carthage College in

Kenosha, Wisconsin, where she is pursuing a classical studies major with an emphasis on archaeology. Taylor drives 40 miles to come here on Thursday and Friday. She works all day Thursday in the archives, and on Friday she helps Stew and Jaclyn with the three-dimensional artifacts. Since her areas of interest are history and artifacts, she is putting her organizational skills to good use in our archives by sorting collections and entering data into PastPerfect.

The efforts of these four have been a tremendous help to us. With them, as well as our other faithful volunteers and our super staff, great progress is being made in the archives.

A Century of Innovation

Haynes International

From the article by
Edmund J. Bickel
Dr. F. Galen Hodge
Dale A. Kingseed
and **Charles J. Sponaugle**

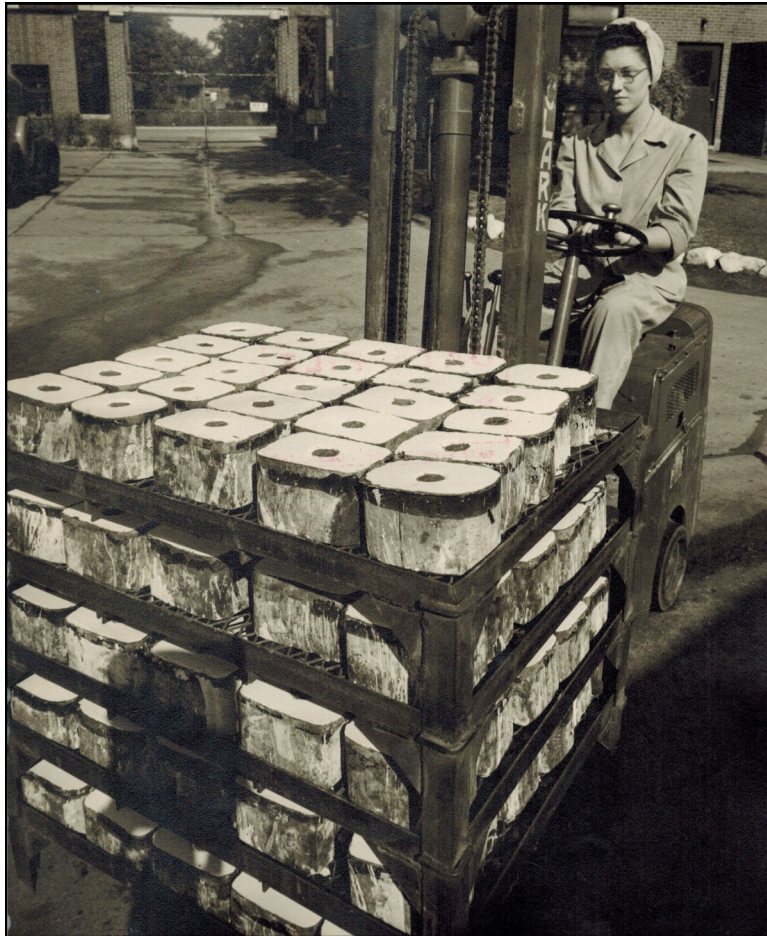
Haynes International will celebrate the 100th anniversary of its founding in October.

Begun by Elwood Haynes, the company traces its origins back to a day in September 1912 when Haynes learned that he would be granted patents for two of his special alloy inventions.

Haynes immediately bought property and constructed a building to house melting furnaces for commercially producing the alloy he called STELLITE®. By December 1912, production was underway at the "Haynes Stellite Works."

Haynes has been described as much more of an "inventor" than a businessman. While actively managing the manufacturing plant, he continued to spend time researching new compositions for his alloys.

In the beginning, Haynes International was a small "mom and pop" operation with four workers: Elwood Haynes, his wife Bertha, his son March, and brother-in-law Harry Lanterman. As with most new businesses, growth was slow during the early years. Equipment initially consisted of 16 gas-fired furnaces, each capable of melting 15 pounds of alloy. Three different grades of STELLITE alloy were produced and cast using graphite molds. During the early years, the alloys were primarily used for cutting tools due to



A woman drives a forklift, moving molds at The Stellite Division during World War II. Women took over many jobs at the company while men were at war.

PHOTO COURTESY OF HAYNES INTERNATIONAL

the durability of STELLITE.

Annual sales for the new company jumped from \$7,000 to \$48,000 in its first two years. In 1915,

Haynes and two local businessmen, Richard Rudell and James C. Patten, incorporated the business as the Haynes Stellite Company.

Patten assumed active management of the new corporation, while Haynes focused upon his alloy research. Under Patten's leadership, sales growth accelerated, and soon the company was selling more volume in a month than previously had been sold in an entire year.

With sales of roughly \$500 million today, Haynes is now in the top 0.2 percent of all U.S. companies. Its products are used throughout the world. Products made in Kokomo are used in parts for almost every commercial airplane that flies today, as well as in military aircraft for the U.S. and its allies. Its alloys enable the production of hundreds of drugs, from the latest cancer-fighting agents to common aspirin. Alloys invented and produced by Haynes International flew on every one of the Apollo and space shuttle flights and are found in the parts for most rockets used in satellite launches today.

The early years

A tireless inventor, Haynes' research at the turn of the 20th century involved finding a suitable spark plug electrode material for the engines produced by his automobile company.

Over the course of ten years, Haynes experimented with various alloys, looking for a good material for cutlery, among other things. He focused on alloys of cobalt, chromium, molybdenum and tungsten.

In September 1912 the U.S. Patent Office informed Haynes that he would be granted two patents for his latest work. It was this event that resulted in the formation of the Haynes Stellite Works in Kokomo.

After its incorporation, the company's sales grew to around \$1 million in 1916. The use of STELLITE alloys for lathe cutting tools was largely responsible for this rapid growth. The tools became so popular that machinists would often take them home at night for safekeeping (since it would be impossible for them to make their quotas if they had to use the more common steel tools). This application set the stage for the first truly important contribution the Haynes Stellite Company made to our country.

During World War I, the strategic importance of the company's alloys became clearly apparent. In this wartime period, demand for industrial production increased dramatically. This was especially true



Elwood Haynes and his patent attorney, Conrad Wolfe, in the office of the Haynes Stellite Co.

HCHS PHOTO

for the manufacture of military aircraft engines. The most important aircraft engine of WW I was the Liberty engine. The 400-horsepower engine was designed to be mass produced with interchangeable parts. More than 13,000 were built before the armistice; and more than 20,000 by the time wartime production ended in 1919.

In a letter to Elwood Haynes in May 1918, Henry M. Leland (inventor of Cadillac and Lincoln automobiles) highlighted the importance of Haynes' alloys to the war effort:

"Now Mr. Haynes, allow me to explain that we are trying to machine 850 steel cylinders for Liberty Aeroplanes daily. We have to take heavy cuts off these forgings and the steel is so hard it is impossible for us to get high speed steel that will stand the work.

As you probably know by reading the papers, it would be difficult to conceive how any greater pressure could be exerted in regard to any product than that which is being pressed upon us to get out quantities of the Liberty Motors.

We have found that this Stellite is very superior to the high speed steel or anything else that we have found. We can and will furnish you with a Priority A certificate if you require it and it will help matters. We are confident that the authorities in Washington will tell you that there is no other government works that ranks ahead of this in importance..."

In addition to the cutting tools, which proved vital to the war effort, the Haynes Stellite Company also supplied nearly 40,000 lancets (scalpels) to army field hospitals. The ability of these lancets to resist tarnishing and maintain a sharp edge often proved to be lifesaving on the front lines.

Union Carbide

The 1920s ushered in a new era for the company. Due to its tremendous growth during WWI, Haynes Stellite became an acquisition target and was sold to, "a group of eastern capitalists," as the *Kokomo Daily Tribune* reported it. Union Carbide's ownership of the company would last for the next 50 years.

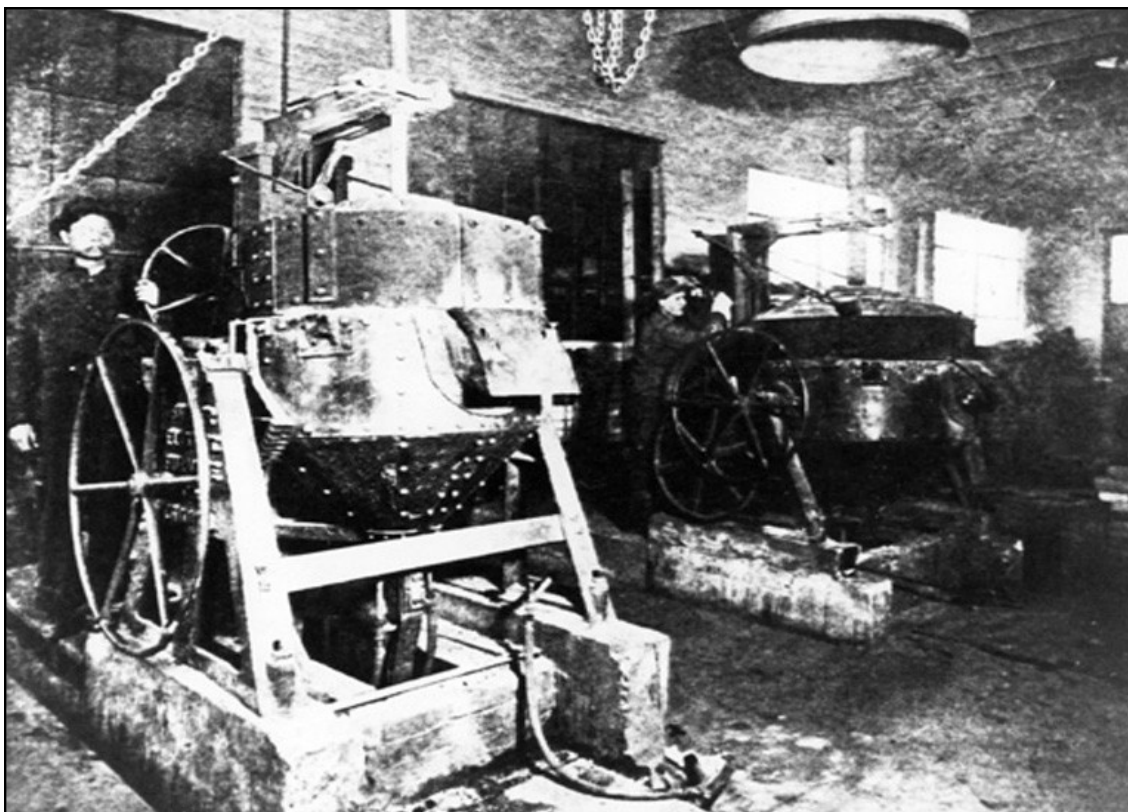
As part of a large industrial company, the newly named Stellite Division of Union Carbide had access to extensive resources for research and development. Four proprietary metals were invented as a result of original research: Hastelloy® A, B, C, and D. Most of these alloys (or their descendants) are still in production today.

In 1922 the hardfacing process was invented. This is a welding process that layers a tough alloy over a weaker, less expensive metal. This "weld overlaying" process is now used worldwide in thousands of applications, from farm equipment to nuclear reactor

containment vessels.

One of the first applications for hardfacing with Stellite alloys was in oil well drilling. Oil exploration was a growing business during the depression, and drill bits hardfaced with Stellite alloys lasted several times longer than the best available alloy steels. Other applications included valves and valve seats in gasoline and diesel engines - the forerunner of Haynes International's current involvement in the aerospace industry.

The 1930s was a time of rapid advancement in the aircraft industry. New, higher horsepower air-cooled gasoline piston engines kept pushing back altitude ceilings and speed barriers. To provide increased reliability and power, aircraft engine exhaust valves were hardfaced with cobalt-base Stellite alloys. Both Charles Lindbergh's *Spirit of St. Louis* and Amelia Earhart's Lockheed Electra had engines with valves hardfaced with Stellite alloy produced in Kokomo.



Two men work with Snyder Electric Furnaces at the Haynes Stellite Foundry.

HCHS PHOTO



As much as half of the workforce during WWII was made up of women at the Stellite Division. Above, a woman polishes a Stellite Division wartime product. Below, right, a wartime worker cleans a casting on a turbocharger bucket used in a WWII aircraft.

PHOTOS COURTESY OF HAYNES INTERNATIONAL

In the late 1930s, a new type of casting process was being used to make parts such as dental restorations and surgical bone pins. This process, also known as the "lost wax" or investment casting process, would lead to what might be considered the most important period of growth for the company.

The war years

As the company embarked upon the 1940s, the war in Europe was just beginning and U.S. involvement was inevitable.

Aircraft engines of that era commonly used superchargers to boost performance and increase horsepower. (A supercharger increases the air forced into an engine by compressing it with a small turbine.) Supercharger turbine blades can experience operating temperatures greater than 1,500°F. Early blades were made from Hastelloy B alloy, which was forged and machined. In a meeting with supercharger manufacturer General Electric Company, the Stellite Division broached the idea of using the "precision casting" or "lost wax" process, to dramatically speed up the manufacture of turbine blades.

The work with GE pushed the Stellite Division into its most important war effort. The need for better blade materials brought Stellite and the "precision

casting" process together just as the conflict in Europe was turning into World War II. By combining a Stellite alloy with the precision casting process, the company was able to produce a turbine blade (also called a "bucket") that was able to withstand the high temperatures and stresses encountered in the supercharger. This was absolutely crucial to the U.S. military, because the supercharger with the Stellite alloy buckets allowed allied bombers to fly above anti-aircraft fire.

Stellite shipped more than 25 million turbine buckets during the war years, with production reaching a peak of greater than 2 million units per month. The process for making these turbine buckets was a closely guarded secret during the war, and plant security was high.

As a consequence of the war effort, employment at the Stellite Division grew dramatically, reaching a peak of about 2,000 workers. With many of the men in the country away serving in the military, there was a shortage of men available for labor at many companies. Stellite in Kokomo was no exception to this, and as much as half of the workforce during the war years was made up of women.

While turbine buckets were a vital contribution to the war effort, the company continued to deliver lathe-cutting tools to machine shops and manufacturers all over the United States. These cutting tools



were essential for the high output demanded for the production of war materials. In addition, thousands of pounds of Stellite Division alloys were being used in the ultra-secret Manhattan Project for the development of the atomic bomb.

After the war, employment at Stellite dropped to about 900 workers, and considerable efforts were made to find opportunities for increasing business.

In light of the increasing demand for wrought products, the company decided to build a new plant. In 1945, land was procured for the Defenbaugh Street Operations in Kokomo. Some of the same equipment installed there in 1948 is still in use today.

The decision to enter into begin production of wrought alloys in the mid-40s was a critical turning point. Up to this point, most of product offered by the company had been in the form of castings. While both cast and wrought products were to be produced for some 26 years after the new plant was built, the future of the company was to become more and more closely linked to the production of wrought products. Today, they constitute the whole of Haynes International's business.

Modernization

During the Korean conflict from 1950-1953, large government defense contracts provided great opportunities for the company and its new wrought alloy operations. Chief among these opportunities was the development of the gas turbine jet engine for the expanding military and commercial aircraft industry.

An alloy sheet product was developed, and this material was used to construct the combustion chambers in the Pratt and Whitney JT3D gas turbine engine, which powered the Boeing 707 commercial passenger jet airliner.

In 1956 the company expanded its manufacturing capabilities with the addition of vacuum induction melting facilities. This capability was needed to maintain a market advantage in the annual supply of 360,000 pounds of investment casting remelt bar to General Motors, to provide for internal investment casting requirements and to open the possibilities for sales of new wrought alloy products.

The company was the primary supplier of these materials for numerous special projects, including the pioneering NASA Mercury space program of the early 1960s. Nearly half of the vacuum cast remelt bar produced by the company at that time was consumed internally for making precision castings for aerospace applications.

The 1960s brought great challenges and opportunities as President Kennedy declared America's intention of landing a man on the moon. The Apollo program used a Saturn V rocket powered by five engines containing nearly 14 tons of nickel and cobalt-based "superalloys", with approximately 2,000 investment castings for each vehicle.

By the end of the decade, a total of 24 astronauts had traveled to the moon—and 12 of them walked on it's surface. The space race afforded the company many great opportunities in the aerospace markets.

The expansion era

The long and rewarding association between the company and Union Carbide finally came to an end in 1970 when the company was purchased by Cabot Corporation, a multifaceted chemical, oil and gas company headquartered in Boston. In a measure of respect to the history here in Kokomo, Cabot management continued the "Stellite Division" company name.

From the outset, the intent of the business strategy developed by Cabot's management was to have the Stellite Division become the dominant producer and supplier of flat products for both the aerospace and chemical process industry markets. In order to broaden their range of products, Cabot aggressively pursued the addition of commercially established, non-proprietary alloys to the lineup.

Utilizing the company's in-house research capability to scale up the materials from lab trials to production, several alloys were quickly adapted to the manufacturing process. For the first time in 50 years, the company began to produce a significant volume of alloys that had neither been invented nor commercially introduced by the company.

While this foray into commodity products was very important, of equal importance was the second part of the strategy: to focus the research and development efforts of the technology group upon the development of whole new families of alloys designed to push the envelope of material capabilities. This effort was to prove extremely successful, as some 10 new alloys were to be introduced over the course of the next 15 years.

Passage of the Clean Air Act in 1970 and establishment of the EPA in 1971 held great promise for the corrosion-resistant alloy business. The government's many efforts to foster environmental improvements included a mandate for the reduction of



Employees of Haynes Stellite stand in front of the South Union Street Foundry in 1916. Bottom row, from left, Ed Edwards (foreman from 1916 to 1920), Clark Hutto, James "Jimmie" Joseph Trayers, Beech Franklin, George Beatty, unidentified person, Otto Coy and Milton Runyon. Top row, Elwood Haynes (inventor and owner), William Branch, Harry Lanterman, Pete Gullion, Bob Buhrman (chief chemist), ? Hollingsworth, William Dampster (electric furnace overseer), William Wissler (metallurgist), Ray Hunt (assistant chemist), Tom Sullivan, Sam Beaman and John Kelly (maintenance and millwright). Employees not shown are James C. Patten and Bernice Haynes (secretary).

PHOTO FROM THE HCHS COLLECTION

sulfurous gas emissions by the nation's coal-fired power plants. This mandate ultimately led to the wide-spread adoption of flue gas desulfurization technology in the power industry, mostly in the form of wet scrubbing units.

These units needed to be resistant to the corrosive acids formed by the flue gases, most commonly sulfuric acid. However, each unit was subject to its own unique operating environment and conditions. Consequently, the selection of the best materials of construction could only be determined through extensive field exposure and evaluation of multiple alloy test racks. Hundreds of such test rack trials were conducted by Stellite in the 1970s and 1980s. These tests led to the adoption and development of more Stellite products.

The geo-political landscape of the world was significantly altered by the OPEC oil embargo in 1973. This supposed protest of western bloc involvement

with Israeli military preparations changed our everyday lives in many ways, bringing about such things as government price controls, gasoline rationing and lower highway speed limits. The persistently higher prices for oil brought on by the embargo also drove the exploration for oil and gas deposits to more and more hostile environments in places such as Alaska and the middle of the North Sea.

Recognizing the opportunities these many changes afforded, the company began to place greater emphasis upon the application of its alloys in the oil and gas industry. This would later lead to development of a major product application in sour gas wells and also to the eventual 1980 joint venture with the Vallorec Company in France to make tubular products for oil and gas exploration.

In the mid-1970s the company also secured the right to produce FERRALIUM® 255 alloy, a super stainless steel. Although mostly used in the chemi-

cal industry, this alloy was used for the replacement of the internal support structure of the Statue of Liberty during the 1983 restoration of the monument. The bars used in this restoration were made in Kokomo and donated to the National Park Service.

In 1978, The Airline Deregulation Act removed government controls on fares, routes and market entry for commercial aviation. This sudden exposure to competition led to significant short-term airline financial losses. No one foresaw the ensuing spectacular growth in the industry. Over the next 25 years, the average ticket price dropped up to 60 percent and the number of passengers tripled. The demand for new commercial passenger aircraft was to prove a major opportunity for Stellite.

The requirement for thousands of new passenger aircraft prompted a major, continuing market demand for existing high-temperature alloys and new proprietary high-temperature alloys that were to be developed by the company over the next 20 years. The aerospace industry requirements for new gas turbine engines with ever increasing needs for higher thrust, better fuel efficiency and lower required maintenance provided an excellent climate for a culture of alloy innovation. This fostered the company's development of a whole new generation of successful high-temperature super-alloys.

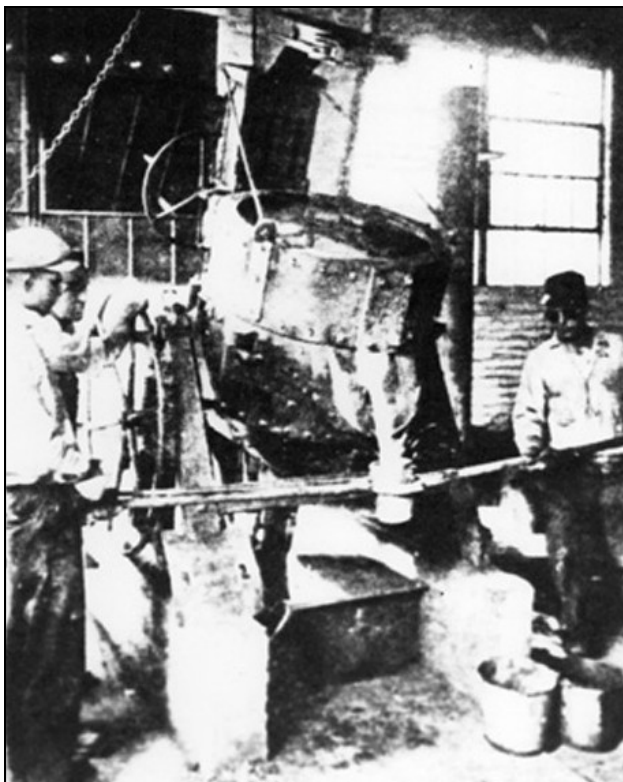
Also, in the 1980s several million pounds of a thin gauge coil were produced for the manufacture of engines of the main battle tanks of the U.S. Army used in the first Gulf War. Also, Stellite acquired Zirtech Company for its titanium seamless tubing business, which was used in aircraft hydraulic control systems. The company also acquired Deloro Stellite Company, a major manufacturer and distributor of a wide spectrum of hard facing products.

Realignment — A time of change

The mid 1980s brought a 20-year period of change to the company, with ownership by various investment bankers and a company name change. In October 1985 Cabot Corporation announced that it would sell the Stellite Division. A partial spinoff was affected by July 1987 and the remainder of the Kokomo-based company was renamed Haynes International, Inc. In September 1989 the sale of Haynes International to an investment banking firm was consummated, and the era of Cabot Corporation in Kokomo came to an end.

A public company

On March 23, 2007, the company completed an initial public offering and was listed on NASDAQ. Its products are used in the most demanding environments and critical applications, just as they were at the beginning of the 20th century. Today, the company's technical and marketing experts are working together with customers in the materials selection process for such vital and exciting areas as solar panel and fuel cell electricity production, deep drilling oil and gas well exploration and production, high efficiency boilers for electricity generation, aerospace, and equipment for the manufacture of new drug therapies. Now well into the 21st century, Haynes International uses its excellence in manufacturing, research and development, sales, marketing and distribution to continue the tradition of innovation established over the last 100 years.



Three men pouring molten Stellite into a ladle during the early years at Haynes International. **HCHS PHOTO**

Membership

Thanks to all who joined the Howard County Historical Society
or renewed their memberships in May, June and July

Dr. Alan & Phyllis Adler	Jim & Jane Goerges	Janet Moore
Barbara Alexander	Ted & Paula Goff	Larry & Sue Murrell
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Syndicate Sales	Dr. David & Barbra Jarrell	Edward & Dixie Stone
Del & Jody Demaree	Richard & Marguerite Kadlec	Jeff Stout
Robert & Janet Duchateau	Glenda Kamosa	Stout & Son Funeral Home and Shirley & Stout Funeral Homes
Joe Dunbar	Mike & Kelly Karickhoff	J. Alan & Lee Ann Teller
Craig Dunham	David & Janice Kellar	Don & Anita Tenbrook
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Beryl Etherington	Joe & Lynda Klein	Larry & Janice Waddell
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Ruth Ford	Sister Martin McEntee	Dr. Don & Deborah Zent
Marlene Foreman	Judge Bill & Marty Menges, Jr.	
Heather Fouts	Gary Mervis	
Mike Freed, Palmer's Jewelry	Margaret Miles	
Jack & Carolyn Garrigues	Bill & Jan Miller	

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