



Smithsonian Connection

SUPPLYING THE BATTLEFRONT

By Leslie A. Przybylek, Curator of History



A three-propeller version of the Curtiss SB2C-1 Helldiver, c. 1944. Early prototypes of the Helldiver date back to 1940, but the plane had a difficult birth. The U.S. Navy only accepted the aircraft after numerous modifications were made, and it first saw combat in November 1943 off of the carrier *Bunker Hill* in the Pacific.

NASA Langley Research Center.

By 1940, Western Pennsylvania was already feeling the impact of the industrial wave that would transform the landscape and its people during World War II. Companies such as Westinghouse Electric Corporation, Carnegie-Illinois Steel, and Mine Safety Appliances searched for new products to fill unprecedented War Department needs. Aviation's expanded role in World War II engaged much of that focus. Westinghouse manufactured everything from aircraft radio tuning units and gear components to experimental new tracking systems involving radar. Carnegie-Illinois Steel worked with manufacturers testing specifications for aircraft armor. Mine Safety developed high altitude breathing equipment for pilots.¹

The blades of an airplane propeller from the Smithsonian Institution's National Air and Space Museum featured in *We Can Do It! WWII* illustrate how aviation's increased military role in World War II altered the life of one Western Pennsylvania community and symbolized a pattern of industrial expansion that played out across the region during the war years.

As the global conflict escalated in 1940, the Curtiss-Wright Corporation churned out hollow steel aircraft propeller blades on Pittsburgh's Neville Island as well as in Indianapolis, Indiana, and Caldwell, New Jersey. The blades—the legacy of earlier efforts by two Westinghouse tool designers to create hollow-steel propellers during World War I—powered World War II aircraft such as the U.S.



The Curtiss-Wright plant near Beaver was part of a large national network that produced propellers and other components for a wide variety of planes. As this advertisement from July 1943 illustrates, these ranged from small carrier-based fighters like the Helldiver to the massive Boeing B-17 "Flying Fortress."

HHC Detre Library & Archives.

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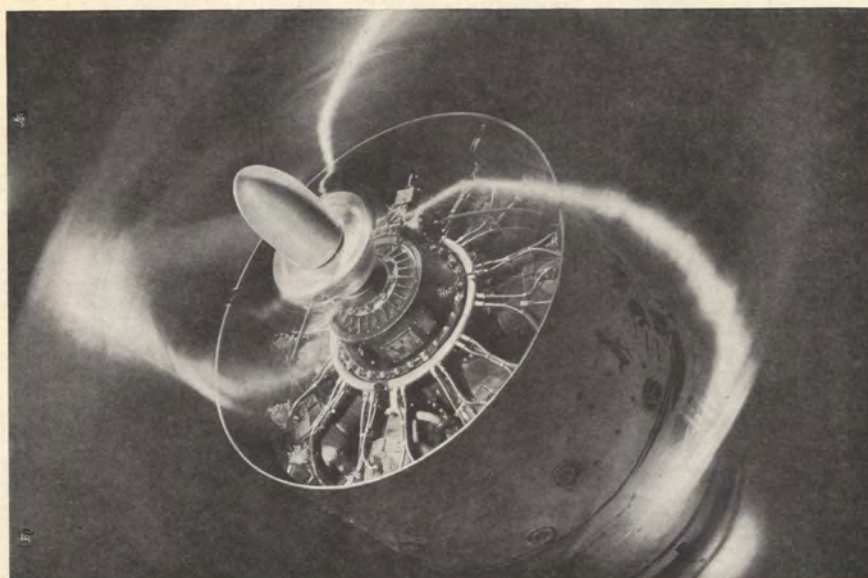
Navy Curtiss SB2C-1C "Helldiver" dive bomber and the Curtiss P-40 "Warhawk."²

Yet even with multiple plants operating at full capacity, Curtiss-Wright could not keep up with the demand. A search began for a new location that would employ nearly 4,000 people. In February 1941, the War Department announced that a site had been chosen—a farm in Borough (now Vanport) Township near Beaver, Pa.³ The site, just to the west and north edge of town, was along Tuscarawas Road, a quiet area that had been part of the busy cross-country Lincoln Highway, 1913–1928.

According to Guy W. Vaughn, president of the Curtiss-Wright Corporation, the new \$5 million facility would be "the largest individual aircraft propeller manufacturing plant in the United States."⁴ The factory brought thousands of new jobs to the region between 1942 and 1945, employing both men and women, especially as welders.⁵ These workers eventually fabricated more than 100,000 new propeller blades for a wide variety of aircraft each year, including blades for the Curtiss Helldiver, a carrier-based dive bomber used in squadron raids against Japan, and the Martin Mars, at the time the largest air cargo transport plane in the world.⁶

Collier's for July 24, 1943

45



"I am the wrath of many men...I am the hope of all"

"My name is Wright Cyclone. My job, now, is war.

"In every single pound of me is more power than in all the straining sinews of a work horse.

"Hours ago my steels and my aluminum were ore in the earth, my magnesium was mingled with the salt in the sea. Hours from now you will see me, speeding more and ever more bombers to enemy targets all over the world. In 42 different types of my country's planes you find me today.

"I am the result of 84 thousand separate and intricate manufacturing operations. I am judged and tested by 55 thousand individual inspections. And the materials that go into my creation are the

product of the skills and the toil of many thousands of men and women in every part of America.

"More than a score of engineering sciences have contributed to my creation. In my cylinders 15-ton explosions create power at the rate of 16,900 blasts every minute—280 every second during the two million miles of flight that is my life expectancy.

"In the years of peace, my reliability and power were developed and proved through more than one billion plane miles of commercial airline service.

"My name is Cyclone. I am the wrath of many men, and my job just now is war.

"But I carry hope, besides."

Yes, hope! For this is power to help the world.

Today, bringing Victory closer, American men and materials are flying in a matter of hours to the farthest corners of the earth... millions of tons of military cargoes are being moved through the sky... nearly 100,000 miles of new air routes have been opened in the past two years alone.

Wright Cyclone engines helped to make that possible... just as they will help to make the last day of this war the first in a great new age of air travel and transportation to come... LOOK TO THE SKY, AMERICA!



GRUMMAN TBF AVENGER—largest carrier-based plane. Picking full-size naval weapons, it proved to be a surprise weapon in the Battle of Midway.



BOEING B-17 FLYING FORTRESS—one of the greatest planes in the war. It striking heavy blows at Berlin and the Ruhr and is active in all war theaters.



LOCKHEED A-29 HUDSON—known as "Old Boomerang" for its ability to attack and return despite enemy fire—a medium bomber for land and sea patrol.



DOUGLAS A-20 HAVOC—tough, fast and hard-hitting, this plane has over thirty tactical uses in bombing, strafing, attacking and fighting.



NORTH AMERICAN B-25 MITCHELL—bombed Tokyo, ship-bombed Japan in the Bonarke Sea, spear-headed African campaign, and fought on every battle front.



CURTISS-WRIGHT SB2C-2 HELLDIVER—the latest in a famous line of dive-bombers, and one of the most powerful, carrying bombs heavy enough to sink battleships.



BOEING B-24 CLIPPER—largest flying boat of Pan-American Airways. Commercial planes and flying boats move great quantities of military tonnage.



MARTIN PBM-3 MARINER—roams over the oceans of the world, serves as eyes of the fleet, fights submarines, carries cargoes to strategic bases for overseas.

**CURTISS
WRIGHT**

Manufacturing Divisions

CURTISS-WRIGHT AIRPLANE DIVISION
WRIGHT AERONAUTICAL CORPORATION
CURTISS-WRIGHT PROPELLER DIVISION

★ Buy War Bonds Today ★

The plant was promoted as a marvel of new technology. According to one advertisement, it was as "clean and cheerful as your own kitchen." Jobs were fully "mechanized so that they can be easily handled by women."⁷ Curtiss-Wright offered transportation services and modern housing nearby, some within walking distance. So many workers desired to move to the area that housing shortages became a serious issue within months of the original site announcement.⁸ By August 1941, Beaver County witnessed the federal approval of at least 1400 new defense homes.⁹ This activity echoed a wider building boom across the Pittsburgh region, where at least sixteen war housing projects took shape from Clairton to Natrona Heights—the highest concentration of any defense district in Pennsylvania.¹⁰

Alas, what wartime production spurred, it also took away. When nuclear bombs at Hiroshima and Nagasaki accelerated the Japanese surrender, the need for military aircraft plummeted. Curtiss-Wright consolidated many of its operations, and the "giant war plant" near Beaver shut its doors on August 22, 1945.¹¹

Such meteoric lifespans marked the trajectories of other large War Department plants in Western Pennsylvania. In Greenwood Township, near Geneva and Meadville in Crawford County, the Keystone Ordnance Works once sprawled over 14,000 acres of farm and wetlands. Built by Fraser-Brace Manufacturing under contract to the U.S. Army Corps of Engineer, the \$45 million plant manufactured TNT, a key explosive during the war. Construction began two days after Pearl Harbor, on December 9, 1941, and the plant began producing TNT by September 1942.¹² At its height it employed more than 2,500 people and actively advertised for workers in Pittsburgh.¹³ But the facility and others like it were victims of their own success. By January 1944, the U.S. Army Ordnance Department's supply of high explosives exceeded its need. To minimize overproduction, multiple large munitions plants were closed. Pennsylvania lost two, including the plant in Geneva and another in Williamsport.¹⁴ Keystone Ordnance Works ceased operation in February 1944, after little more than a year of full-scale production. The plant briefly reopened again in July, but its days were numbered.¹⁵ Today, most of it is gone. A few rusted frames, ruined brick structures, and grassy hillocks barely hint at the extent of what once stood there.

Like the Curtiss-Wright propeller plant in Beaver, the very success of the Keystone Ordnance Works curtailed the need for what it produced. Similar stories played out across Pennsylvania and the nation between 1944 and 1945, as changing military tactics and technology followed by peacetime industrial retractions shuttered new factories, canceled federal contracts, and gave workers different challenges to address. At the Dravo Corporation, for example, employment numbers dropped precipitously in 1945; from a high of nearly 16,000 people at the company's massive Neville Island plant, the workforce shrank to

1,123.¹⁶ By August 1945, the War Manpower Commission estimated that nearly 35,000 workers in the Pittsburgh District would be laid off as war contracts were canceled and munitions plants closed.¹⁷

So what became of that modern new propeller factory in Beaver County? The plant's closure threw thousands of people out of work, and a search for new buyers began almost immediately, a process complicated by the fact that the facility was government-owned. In March 1946, newspapers announced that Western Electric Co. had signed a lease and would begin manufacturing telephones and electronics equipment there.¹⁸ But within months, the deal was vetoed by the War Assets Administration. In a legacy coming full circle, Pittsburgh's own Westinghouse Electric Corporation finally purchased the plant in March 1947.¹⁹ Westinghouse

The Tuscarawas Road entrance of the Curtiss-Wright plant in Beaver, Pa.
Beaver Area Heritage Museum, 2010.02.01a.



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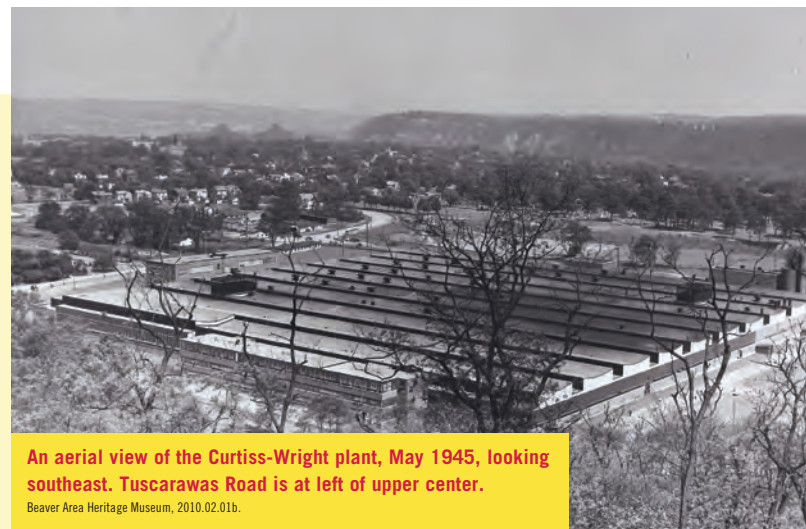
The Keystone Ordnance Works near Meadville, Pa. manufactured TNT for use in shells and other explosive devices. This U.S. Army Signal Corps photograph shows how the TNT, which was described as a powder that "looked like brown sugar," was loaded into waiting shells in March 1943. LoC 8b08264.



The local Curtiss-Wright plant was profiled in a short 1944 employee recruitment film.

The factory brought thousands of new jobs to the region between 1942 and 1945, employing both men and women, especially as welders.

moved its Standard Control Division from East Pittsburgh to Vanport Township and operated the plant as part of its electronic distribution and control unit for more than four decades, before selling it to the Eaton Corporation in 1993-1994. The Vanport plant became part of Eaton's Cutler-Hammer Division, manufacturing electrical equipment such as circuit breakers.²⁰ Weathering the nation's economic roller coaster of recent years, the Vanport Township plant continues in operation today under the name of Eaton Electronics. It still employs some third-generation workers whose grandparents first walked into the factory during that rush of industrial expansion in the early days of World War II.²¹



An aerial view of the Curtiss-Wright plant, May 1945, looking southeast. Tuscarawas Road is at left of upper center.

Beaver Area Heritage Museum, 2010.02.01b.

¹ Examples are based on artifacts, photographs, and documents featured in *We Can Do It! WWII*, including a Westinghouse GP-7-2 radio tuning unit (for ship to air communication) on loan from the Smithsonian Institution, National Air and Space Museum; documentation of Carnegie-Illinois Steel wartime activities as found in the records of the William J. Gaughan Collection, Series II, Box 3, AIS.1994.03, Archives Service Center, University of Pittsburgh, and images from the files of Mine Safety Appliances Company (now MSA), see: *That Men & Women May Work in Safety, The First 100 Years of Mine Safety Appliances Company* (Echo Memoirs Co.: 2014), 116-117.

² The primary designer was Thomas A. Dicks, who reportedly developed early models out of a small shop in Homewood and became involved with multiple early propeller manufacturers in Pittsburgh. See: William F. Trimble, *High Frontier: A History of Aeronautics in Pennsylvania* (Pittsburgh: University of Pittsburgh Press, 1982), 116; and "Work Started a year Ago on Curtiss-Wright Plant Here," *The Daily Times* (Beaver and Rochester, Pa.), April 21, 1942.

³ Some newspaper accounts at the time refer to the land selected as being in "Beaver Township," probably a corruption of the township's original name "Borough Township." The official designation was changed to Vanport Township in 1970. The name shift was recorded by the Beaver County Bicentennial Atlas (1976), as accessed online at: <http://www.bchistory.org/beavercounty/BeaverCountyCommunities/VanportTwp/VanportTownship.html>, part of the Beaver County History Online project.

⁴ "Big Propeller Plant Will Be Built Near City," *Pittsburgh Post-Gazette*, February 27, 1941.

⁵ A Beaver-area newspaper highlighted women welders in a photo feature in 1943, see: "Women Welders at Curtiss-Wright Propeller Plant," *The Daily Times* (Beaver and Rochester), October 30, 1943. The need for welders was also stressed in an article in early 1945: "Fighting Planes Grounded Waiting for Propellers," *The Pittsburgh Press*, January 17, 1945.

⁶ For a full listing of the propeller types produced at Beaver, see: "Army-Navy 'E' Won by Makers of Propellers," *The Pittsburgh Press*, June 18, 1943; and "A Message from Mars," (advertisement) *The Pittsburgh Press*, April 12, 1944.

⁷ "Look to the Sky, America!" (advertisement) *The Pittsburgh Press*, April 12, 1944.

⁸ "Housing Needs of County Stressed at Two Meetings," *The Daily Times* (Beaver and Rochester), May 24, 1941.

⁹ "Approval Given 900 New Homes Here for Defense Workers," *The Daily Times*, August 1, 1941.

¹⁰ Kristin Szylyan Bailey, "Defense Housing in Greater Pittsburgh," *Pittsburgh History* (Spring 1990), 18, 20. Pennsylvania had the fifth highest total among all states for new housing units. California was first, thanks in part to the state's prominence in the aviation industry.

¹¹ "Curtiss-Wright Beaver Plant May Be Sold," *The Pittsburgh Press*, March 22, 1946.

¹² The story and fate of the massive Keystone Ordnance Works compound was well-documented in regional newspapers, see for example: "Powder Plant is Advanced," *The Pittsburgh Post-Gazette*, November 18, 1941; "Output Drops at Meadville Powder Plant," *The Pittsburgh Press*, January 16, 1944; and " 'Tale of Two Cities' War Boom to End With Closing of Plant," *The Pittsburgh Post-Gazette*, January 31, 1944.

¹³ For example, see: "Boost War Production / Keystone Ordnance Works," *Pittsburgh Post-Gazette*, December 10, 1942. Interviews were scheduled at the Hotel Henry, on Fifth Avenue in downtown Pittsburgh.

¹⁴ The Williamsport facility was the Pennsylvania Ordnance Plant, see: "Output Drops at Meadville Powder Plant," *The Pittsburgh Press*, January 16, 1944; and also: "Big Explosives Plants Closing," *Toledo Blade*, January 15, 1944; John L. Edwards, "Tale of Two Cities War Boom to End with Closing of Plant," *Pittsburgh Post-Gazette*, January 31, 1944.

¹⁵ "Ordnance Plant to Be Reopened," *The Daily Times* (Beaver), July 15, 1944.

¹⁶ "Behind the Marker; Dravo Corporation Historical Marker," online article at ExplorePAHistory.com, see: <http://explorepahistory.com/hmarker.php?markerId=1-A-2F6>.

¹⁷ "Plants Here to Lay Off 7,000 Workers Today," *Pittsburgh Post-Gazette*, August 17, 1945; "Closing of War Plants Lets Out 400,000; Million More Out Soon," *The Evening Independent* (St. Petersburg, Fla., AP article), August 16, 1945.

¹⁸ "Beaver Plant Built for War to Run Again," *The Pittsburgh Press*, March 24, 1946.

¹⁹ "Large Firms Want to Buy Beaver Plant," *The Pittsburgh Press*, June 6, 1946; "Award Likely to Come Soon, Westinghouse Electric Prominently Mentioned as Prospective Buyer," *Pittsburgh Post-Gazette*, August 21, 1946; "Westinghouse Expansion," *The Pittsburgh Press*, August 23, 1946; "Westinghouse Buys Curtiss-Wright Plant," *Gettysburg Times*, March 13, 1947.

²⁰ "Westinghouse Sells Unit to Raise Cash," *The Sunday Gazette* (Schenectady), August 11, 1993; Pamela Gaynor, "Westinghouse in deal to sell Green Tree-based Division," *Pittsburgh Post Gazette*, August 12, 1993. "Cutler-Hammer," *Allegheny Times*, February 6, 2001; Eaton Corporation, History Timeline, 1994: accessed via <http://www.eaton.com/Eaton/OurCompany/AboutUs/HistoryTimeline/index.htm>.

²¹ "Durability Defines Workforce at Eaton's W. Pa. Circuit Breaker Plant," *The Electrical Worker Online*, September 2014, as accessed at <http://www.ibew.org/articles/14ElectricalWorker/EW1409/Eaton.0914.html> on December 15, 2014; Bob Boulder, "Eaton Corp. to close Vanport Twp. plant for one week," *Ellwood City Register*, March 4, 2009; Kimberly K. Barlow, "Cutler-Hammer: Area job loss will be under 100," *Beaver County Times*, July 24, 2001; Vanport Township Business directory, <http://www.vanporttp.com/business-directory/>.

Special thanks to Christopher Moore and Jeremy Kinney at the National Air and Space Museum for information connected with this article."

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Another scene from the 1944 film.