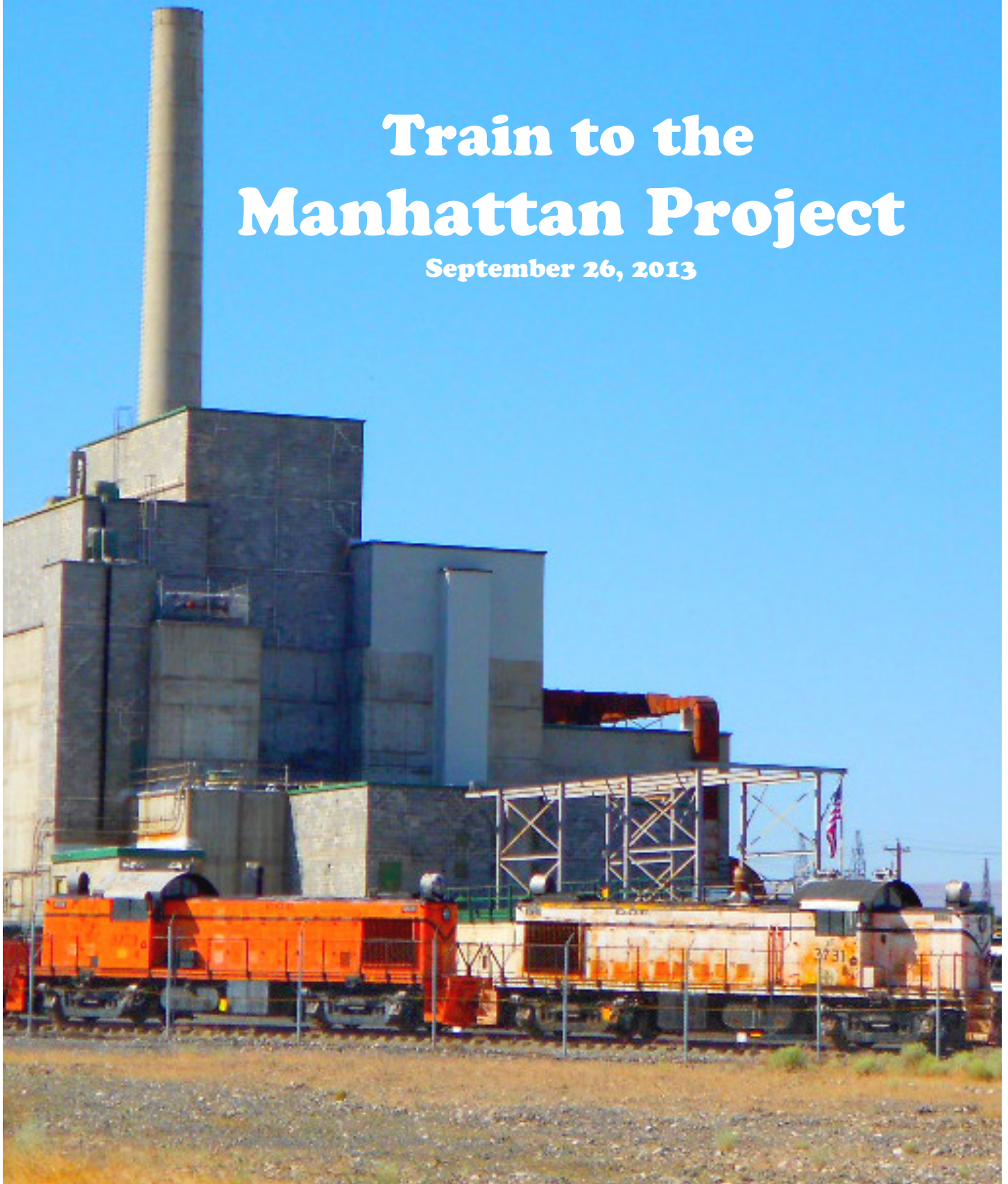


Journey to Destiny

Train to the Manhattan Project

September 26, 2013



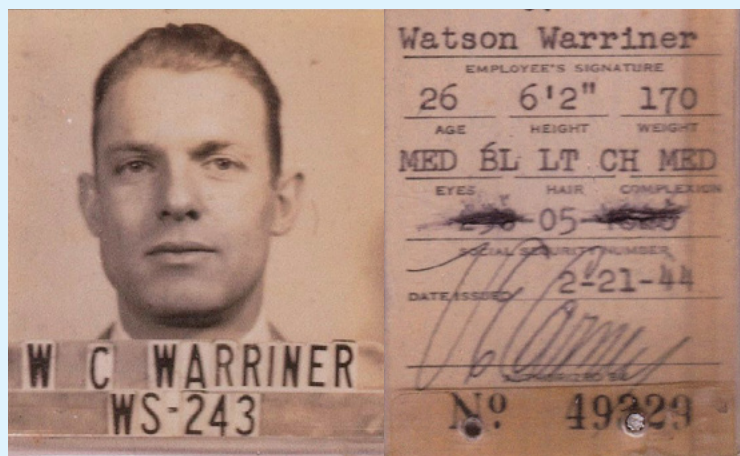
Greetings from Watson Warriner!

Watson C. Warriner, Sr., a chemical engineer, worked for DuPont on the Manhattan Project. He helped design and build the first chemical separation plant at Hanford (also known as the 221 T-plant or "Queen Marys"). In an oral history conducted by the Atomic Heritage Foundation, Watson recalled his work at Hanford on the Manhattan Project and discussed his lifelong interest in trains. For the full interview, visit www.manhattanprojectvoices.org.

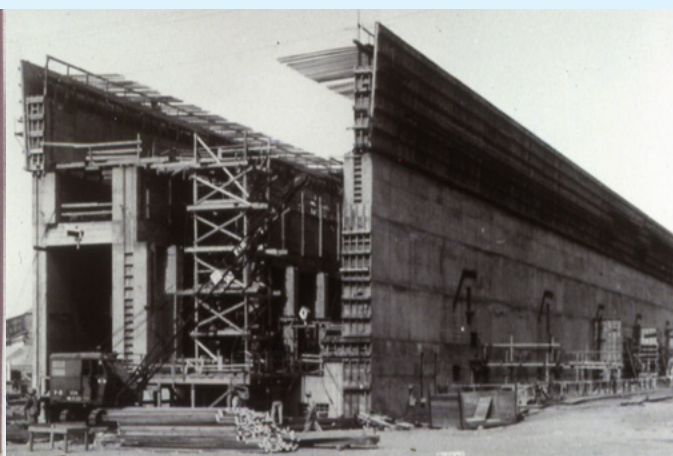


My father and I went to the 1933 World Fair, and the most impressive exhibit there was the DuPont Company. And here I was, a junior studying chemistry. I had always really wanted to work for DuPont. So I was happy to get an offer in January 1939. That started my career with DuPont. My first job with them was working in the synthetic rubber plant, producing neoprene, one of the first synthetic rubbers.

In January 1944, Walter O. Simon, DuPont's Plant Manager at the Wabash River Ordnance Works in Newport, Indiana, got a telegram from Everett G. Ackett, chief engineer of DuPont. "Watson Warriner is to report to Wilmington immediately for future assignment." Walter said, "Watson, we were informed recently that there would be requests for people to enter this secret project. I can't possibly tell you what it is because I don't know. You're to leave tomorrow." And that was the beginning of my entrance to the Manhattan Project.



Watson Warriner's Hanford ID badge



Building the T Plant at Hanford

I spent the night at the Hotel DuPont in Wilmington, a beautiful hotel and in the same building as the headquarters of DuPont. That morning, when I went down to breakfast there were about three or four of my cohorts doing the same thing. I said, "What you doing here?" "Well, we don't know." Several of us ended up in the engineering department of the same building. DuPont people in the legal department began to tell us about this secret job. They read the Espionage Act to us and said, "Do you fully understand that?" "Do you completely understand this? Because any revelation of this secret project is subject to death."

If you look at the 1943 railroad map, it will show a 45-mile spur of the Chicago, Milwaukee, St. Paul & Pacific Railroad commonly known as "The Milwaukee Road" and now abandoned, that comes out of Beverly, Washington and goes to the tiny little town of Hanford. That spur was already there when General Groves decided to build a plant there. It was just one of those miracle things that happened. The B Reactor was built right at the end of that 45-mile spur. Before Hanford was ever built there was a freight train, what they call a "mixed train," that ran three times a week from Beverly, Washington to Hanford.

The first thing that came in over that original 45-mile spur were 23 steam locomotives. These locomotives were confiscated from the railroads. In other words, the Manhattan Project just took them. The locomotives were to be distributed in groups of three throughout the construction village of Hanford. Now this construction village was a big one. Matter of fact, before it finished we had 50,000 people there, at first living in Army tents, then barracks, Quonset huts and other structures. We had hospitals, office buildings, movies, everything.



A cask car used to transport irradiated fuel from the B Reactor to the T Plant

When we were building the Hanford Engineer Works, most of the locomotives that the railroads were using in those days were big steam locomotives. But when a plant started up, the operating people wanted to use diesel locomotives which are much easier to handle. Those are the locomotives that you see when you visit the B Reactor [see photo above].

I love railroads and on some weekends I would go down to Pasco and ride around the yards with some of the locomotive tenders there. They would ask me, "What are you people doing with all these locomotives [at Hanford]?" They knew that they had been confiscated. Since we were required not to tell anything about the project, my response was, "I have no idea what they are doing with them."

Journey to Destiny

Wartime memoir: a bachelor baby-sitter on the *North Coast Limited* helped his country produce the atomic bomb

BY WATSON C. WARRINER

I ARRIVED AT CHICAGO UNION STATION in February 1944 in the morning on the Pennsylvania Railroad's Broadway Limited, the fastest, most luxurious train from Philadelphia. My edition of No. 29 was pulled by doubleheaded K4 Pacifics in their raw beauty, untouched by Raymond Loewy streamlining. As I headed for the station, I slowed my pace to admire these steeds that had brought me through the winter night, then left them to the hands of their hostlers.

I was heading west on Northern Pacific's North Coast Limited to Pasco, Wash., with hostler duties of my own—tending a new mother and infant son for 2000 miles. My destination: Hanford Engineer Works, a key facility in the production of atomic bombs.

I made my way through the milling throng into the huge main waiting room, where I searched for Margaret Stewart and son. Her trip had been arranged to coincide with my transfer to Hanford. Margaret's husband, Bob, and I were chemical engineers with Du Pont, which was enlisted by the U.S. government in November 1942 to design, construct, and operate facilities to produce plutonium (Element 94) in sufficient quantities for atomic bombs. Ours was an important piece of the top-secret "Manhattan Project," the code name for the creation of the atomic bomb. (The "Manhattan District," created by the Army Corps of Engineers and directed by Gen. Leslie Groves, covered all designated geographical locations of facilities involved in the project.)

Already at Hanford, Bob was engaged in constructing the "B" reactor, first of three to be built. As an expectant mother, Margaret had not accompanied him to Hanford, a desolate site consisting mostly of sand and sagebrush, inhabited by big jackrabbits and rattlesnakes. Some 45,000 construction workers were housed in Army-style barracks in the hastily constructed temporary village. Richland, the permanent city, was under construction with individual houses and would eventually accommodate 3275 Du Pont families. Bob and Margaret's house had just been completed.

MY SEARCH WAS REWARDED; I spotted Margaret with young Bob Jr. in a basket. In the other hand was a small satchel with enough feeding bottles of formula for the long journey. She quickly thrust me into my new duties, and my bachelor status at 26 would be on hold. As departure time approached, the announcer boomed, "The North Coast Limited departure is delayed; all Pullman passengers check at the conductor's desk in the gate area."

The inbound North Coast had been delayed by severe weather and could not be serviced in time to be turned, so our consist would be a "make-up train." Organized confusion reigned as our Pullman conductor frantically tried to match section, roomette, and bedroom reservations with the new car diagrams. Since I was escorting a young mother and baby all the way to Pasco, my plea fell on sympathetic ears. He gave us a roomette and bedroom in the same Pullman car.

Boarding was still postponed, so we enjoyed a hasty dinner in the large Harvey House restaurant adjoining the main waiting room and completed our meal just as boarding was announced. We headed down the platform to our car, the last one on the long train.

Our first surprise: no rear observation lounge car. "Too bad," exclaimed the porter, "it's on the eastbound Limited." I settled Margaret and the baby in the bedroom, their home for the next two nights and two days. Finally the train lurched forward. My first duty was to get the satchel and its feeding bottles into a refrigerator, so I went forward through the swaying train heading for the diner and a refrigerator.

We soon reached track speed on the Burlington Route, and snow blew in through the diaphragms and swirled about in each vestibule. As I proceeded through car after car, I was thinking the diner must be next. To my (second) surprise and dismay, the last car had a solid door with a brass knob—the baggage car! "No diner until you get to St. Paul in the morning" was the baggagemaster's reply. "But, you'll have it all the way to Pasco. Give the satchel to your porter for the night; they always think of something."

I returned to our Pullman with a genius of a plan. I removed two bottles from the satchel, one for the baby's 11 p.m. feeding and one for 6 a.m. Since our car was on the rear, the porter put the satchel in a corrugated box and buried it in the accumulated snow on the floor of the rear vestibule. He assured me this entrance would not be used until we arrived in St. Paul. Margaret warmed the night bottle with hot water from the lavatory tap.

My solution to the early-morning feeding? I inserted the bottle between the drawn curtain and the cold frosted pane in the window of her bedroom—a perfect refrigerator for the night! Margaret marveled at my ingenuity, but better, it would save me from that 6 a.m. wakeup and icy visit to the rear vestibule. A well-fed baby, weary mother, and tired bachelor retired for the night in our warm, rolling heavyweight car.

IN ST. PAUL, where the North Coast gained home Northern Pacific rails, the dining car was indeed added and the satchel put in a refrigerator. Scheduled baby feedings coincided with dining hours except those at 11 p.m. and 6 a.m. since the diner closed at 9:30 p.m. and opened at 7 a.m., this necessitated a nightly journey through the train to retrieve the two bottles for the late-night and early-morning feedings. Thus for two days, several times a day, I traveled this long train with bottle(s) in hand. Fellow passengers inquired, "How is the wife and baby?" It was expedient to answer, "Just fine," rather than go into a lengthy explanation. It was a mistake I would regret!

The next morning, in Whitehall, Mont., two steam locomotives—pushing a troop sleeper and two day coaches—coupled to our car. The highball came shortly, followed by our big push over the Continental Divide. Armed with my 35mm Argus C-3 camera, I went mid-train and opened a Dutch door.

From Aug 1995 "Trains" issue. Reprinted with the permission of Kalmbach Publishing Co. All rights reserved.

The big 4-8-4 ahead and the two rear pushers labored up to Homestake Pass with sharp exhausts echoing off the rocky hills. Occasional squeals from six-wheeled trucks working their way around sharp curves proved that Homestake (elevation 6356 feet, its track now no longer in service) was yielding grudgingly. Servicemen bound for the Pacific enjoyed the scenery from coach windows and the open center door of the troop sleeper. At the summit, the two pushers uncoupled.

My curiosity turned to the three extra cars on the rear. I opened the vestibule gate and stepped into the troop sleeper. What a contrast, going from the luxurious heavyweight and six-wheel-truck Pullman to a four-wheel-truck steel boxcar with windows and bunk beds! Every roadbed imperfection, barely detectable in our Pullman, produced much rumbling, bumping, and thumping. My presence was immediately challenged by the captain in charge. Civilian clothes and no military “dog tag” required an explanation.

“You don’t look like a ‘4-F’ (physically unfit for military service) to me,” said the captain. My quickly produced draft card (deferred for occupational reasons) aroused even more suspicion. Comradery slowly displaced the doubts when I explained my involvement in the production of smokeless powder for cannons and rifles, and TNT and plastic explosives for bombs and demolition,

Fortunately, there were no further questions about my destination and present assignment. My lips had been sealed on this phase of my duties in January 1943 when I was inducted into the Manhattan Project with a “Q” clearance. Any project revelations by me to unauthorized persons were punishable by death.

Satisfied with my civilian status, the captain, now surrounded by several GI’s, inquired if I had any “ammunition” with me—booze, to be specific. The stop in Butte provided enough time to visit a nearby liquor store. Two toots from the Northern sent me racing back to the slowly moving train, and I handed up the bag to the captain and hopped aboard.

Any remaining suspicions were quickly displaced by the elixir, which gradually disappeared during the day. The Captain and I departed with a handshake as we pulled into Spokane, where his cars were uncoupled to take a different westbound route. He left not knowing that the Manhattan Project effort, if successful, would abruptly cause the termination of the war. (It did, in 18 months, saving many American lives.)

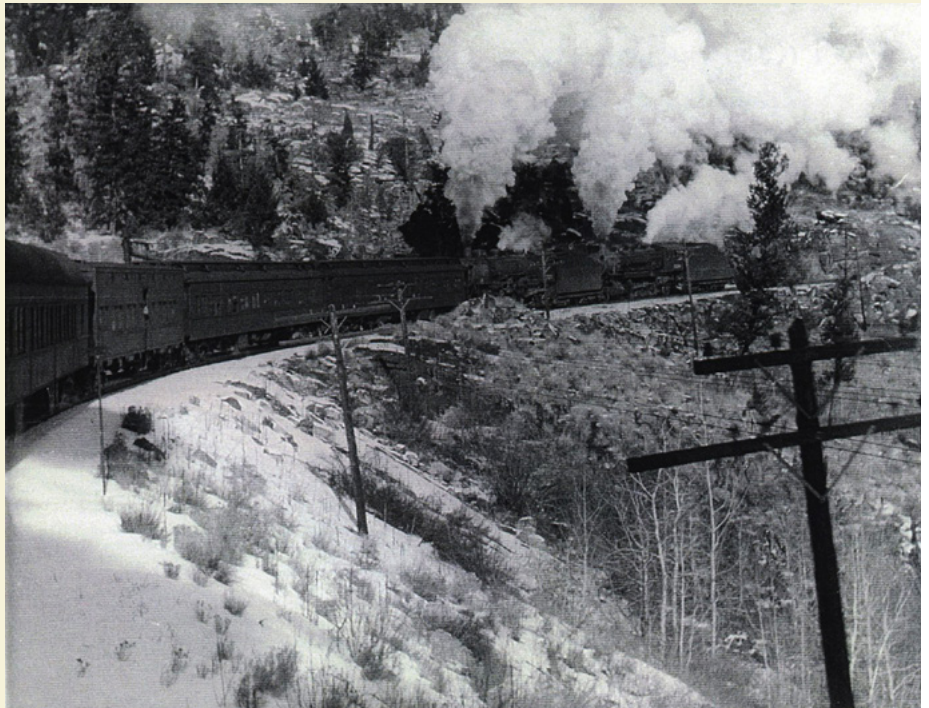
SHORTLY AFTER MIDNIGHT we arrived in Pasco and stepped off into a blowing sandstorm. Tumbleweeds raced wildly across the open station platform.

Bob emerged from the crowd to greet his wife, and his first child, whom he had never seen. The train slowly pulled out of the station. With glimmering red marker lights and accelerating sharp exhaust blasts from the 4-8-4’s stack, the North Coast Limited disappeared into the night.

Construction of the enormous Hanford facility was underway. For the previous year I had been in Wilmington, Del., engaged in the design of the three separation plants. Now I would assist in building them. Dormitories in Richland served as living quarters for single men in supervisory capacities. Not far away was similar housing for single women, mainly stenographer, secretaries, and telephone operators.

The great news was that “socials” were held in the small reception area of the several dormitories each Sunday night, and single males had a blanket invitation! I welcomed the resumption of my social life and headed for the nearest dorm the first Saturday night. Big Band music from a record-player filled the air as I opened the door.

My invitation to dance was readily accepted by one of several girls chatting together. She was very pretty, from Minneapolis, and our immediate mutual attraction worked wonders for my ego.



Our conversation was gaining momentum when she suddenly pulled back, looked me straight in the eyes, and said, “How do you get away from your wife and baby?”

Our dancing slowed and we moved to the side, surrounded by her friends. They quickly joined in the inquisition. “We came out from St. Paul last week and saw you hauling baby bottles through the train, so don’t tell us you aren’t married!” Now in full retreat, my explanation of baby-sitting in tatters, I left this dorm, never to return. Fortunately, girls in the other dormitories had arrived on other trains, so my bachelor status was never questioned.

Social life resumed; but serious work lay ahead.

ONE-THIRD THE SIZE OF DELAWARE, the Hanford site occupied 631 square miles and was served by a 45-mile spur off the Milwaukee Road from Beverly, Wash. About 24 miles of this spur were included within the Hanford boundary. Over the course of the project, 40,000 cars brought

in 780,000 cubic yards of cement, sand, and gravel for concrete; 160 million board feet of lumber; 40,000 tons of structural steel and reinforcing bars; and 8500 pieces of construction equipment (some used to move 25 million cubic yards of earth). Within Hanford was a plant railroad of 158 miles of track, plus 345 miles of roads.

When production commenced, the Hanford railroad's Alco diesels transported the highly radioactive slugs from the three widely dispersed reactors to the three separation plants. Performing this service was a cask car—a hollow rectangular cask with thick walls of lead and removable lead lid mounted on a flatcar. At the separations plants, remote control was used to chemically separate plutonium from the approximately 30 highly radioactive byproducts produced by neutron bombardment of the slugs containing uranium in the reactors. The final product, plutonium nitrate, only mildly radioactive, left the Hanford works in the form of a "syrupy" solution. Its destination was Los Alamos, N.Mex., where it was converted to metallic plutonium and fabricated into bomb components.

The first and only plutonium shipment from this facility to go by rail occurred on February 2, 1945. It consisted of 100 grams of solution in a stainless-steel flask, which easily contained the mild radioactivity, personally carried aboard passenger trains by two military officers. Their routing was SP&S from Pasco to Portland, SP to the San Francisco area, and then Santa Fe to Lamy, N.Mex., thence by automobile to Los Alamos.

As railroad traffic managers eventually learned, product shipped from this enormous facility produced zero revenue. Conventional military explosive plants produced tons of smokeless powder, TNT, and plastic explosives and generated weekly (often daily) carload shipments to army ordnance depots and plants for loading into projectiles. In contrast, years of production from Hanford could easily be accommodated in one boxcar as a small LCL shipment. After the initial rail delivery, all others went in olive-drab panel trucks in heavily guarded convoys.

MY HANFORD ASSIGNMENT ended in late 1944 with a transfer to Alabama, followed by another in early 1945 to Picatinny Arsenal at Dover, N.J. It was mid-April, and a June wedding in Memphis was on the schedule, so I had to purchase the ceremonial ring. On a Saturday I left Denville, N.J., on a Lackawanna suburban train, headed for Hoboken and New York City. After dinner in Manhattan with friends, and with the ring in hand, I took the ferry back over to Hoboken and boarded the last westbound train around midnight. Fatigue and warmth of the coach caused me to doze.

Subconsciously I thought I heard the conductor announce, "next stop—Denville." A nearby passenger confirmed that he thought it was Denville. I reached the vestibule of the accelerating train and clambered down the open trap, glancing quickly ahead and jumping down to the rapidly disappearing platform. The chilly night air penetrated my light spring suit and quickly revived me as I watched the markers disappear down the long straight stretch of track.

Something was wrong—the Denville station was on a sharp curve. Where was I at this wee hour? Maplewood. With no one in sight, I headed for the station. The ticket agent had long since

departed, and the schedule posted by the window indicated I was only about halfway to Denville. Frequent trains were listed, but most of them did not operate on Sunday. The next train, at 8:30 a.m., was eastbound, followed by 9 a.m. westbound, so I was stuck until morning in this enclosed but unheated station. I stretched out on one of the wooden benches and dozed off. Next morning, I arose in an empty station. The first westbound arrived and delivered me, ring and all, to Denville.

In June, I departed for Memphis on the Pennsylvania to Washington, D.C., where I took the Southern Railway's Tennessean. On the evening of our wedding day, June 6, my bride, Ann, and I headed back for New York City, but on an alternate route. I had reserved the drawing room in a through Pullman on Louisville & Nashville's Azalean for the two-night, one-day trip. The car was routed L&N via Louisville to Cincinnati, thence PRR via Pittsburgh to New York City. The club car was crowded with festive passengers going to Louisville and celebrating the resumption of the Kentucky Derby. All horse-racing had been banned when war was declared, but the ban was lifted on V-E day, May 8. Thus the Derby would run on Saturday, June 9, instead of the traditional first Saturday in May.

RETURNING FROM PICATINNY ARSENAL to our small rented cottage at nearby Budd Lake, N.J., the afternoon of August 6, 1945, Ann greeted me with excitement. "Now I know what you did in Hanford," she said. "Listen to the radio; an entire Japanese city (Hiroshima) has been destroyed by a powerful bomb."

It was a chilling but welcome announcement. This uranium bomb was code-named "Little Boy." Three days later a plutonium bomb code-named "Fat Man" leveled Nagasaki. V-J Day arrived with news of the Japanese surrender, and we drove to Times Square for a night of celebration with the thousands assembled there.

Only 32 months had elapsed from the first sustained chain reaction for producing plutonium on December 2, 1942, at the University of Chicago by the noted physicist, Enrico Fermi, and associates. Only one milligram of plutonium existed at that time. Design of the huge, complicated facilities at Hanford, scaled up from such a miniscule quantity, was unprecedented. By the end of 1945, 266 pounds of plutonium had been produced at Hanford, enough for 19 "Fat Man" bombs.

My wife and I returned to Wilmington, and shortly thereafter I received a "Certificate Of Appreciation For Effective Service To The Manhattan District," issued by the War Department, Corps of Engineers, Manhattan District, and embossed with my name. Signed by Henry L. Stimson, Secretary of War, it was dated August 6, 1945, the date the bomb exploded over Hiroshima. Accompanying it was a bronze "Manhattan Project" lapel pin with a big embossed "A."

Du Pont turned the Hanford Works over to another contractor on August 31, 1946. Hanford was a vital part of the Manhattan Project. More than 100,000 Americans were involved, but only a small number knew of the top-secret end product until the bombs were dropped. It was truly a remarkable national achievement, and one impossible without our railroads.

References: "History of the Hanford Engineer Works, Vols. I, II, III, IV"; "Hanford and the Bomb," by S.L. Sanger, with Robert W. Mull; and "Now It Can be Told," by Gen. Leslie R. Groves.

Painting the Trains



After irradiated fuel from the B Reactor had cooled off in the storage basin full of water for about 90 days, workers used twenty-foot long tongs to place the irradiated fuel into buckets. To transport the fuel to the chemical separation plants, engineers designed special lead-lined cask cars.

The fuel elements were loaded, under water, into a cask, which was sealed with a lid. A locomotive pulled the cask cars for their ten-mile journey to the three chemical separations plants, entering them through a railroad tunnel. Two 125-ton locomotives and two cask cars are on display at B Reactor. A bucket with fake slugs illustrates the once "hot" cargo. The locomotives pulled the fuel-laden cars to the plants for processing.

Thanks to generous grants from Watson Warriner and Clay and Dorothy Perkins, the Atomic Heritage Foundation plans to repaint the locomotives to their original bright orange. The lead locomotive will be painted the official Hanford Engineer Works colors, orange and black. Missing builders plates will be replaced for both locomotives. Department of Energy restrictions on donations has delayed the painting, but once the Manhattan Project National Historical Park is established by Congress, the paint job should move forward.

AHF hopes to raise funds to design interpretive panels to accompany the trains. The interpretive panels will explain the role of the locomotives and cask cars on display and the significant role of the US railroads in the Hanford Engineer Works. Forty thousand freight cars delivered materials on 158 miles of new track and 23 steam locomotives provided heat for 50,000 workers. To contribute, please contact AHF President Cindy Kelly at ckelly@atomicheritage.org or 202-293-0045 or visit AHF's website, www.atomicheritage.org.



One of the locomotives at the B Reactor that AHF plans to repaint to its original orange

Welcome to the B Reactor



The Northern Pacific Railroad Bridge, which connected Pasco and Kennewick from 1922 until its 1990 demolition

Pasco, Washington got its start as a railroad town, receiving an influx of settlers when the Northern Pacific Railway was built in the 1880s. Most of the tens of thousands of workers who came to work at the Hanford Engineer Works arrived by train, passing over the railroad bridge over the Columbia River into Pasco.

In December 1942, the Army Corps of Engineers worked with DuPont to establish criteria for the selection of a site for plutonium production facilities. The project needed at least 190 square miles of secure space located at least 20 miles from any sizable town and 10 miles from a major highway. Most importantly, the project needed a water supply that flowed at a rate of 25,000 gallons per minute and an electrical supply of at least 100,000 kilowatts.



The majestic Columbia River

B Reactor was the first of three plutonium production reactors designated for the 100 area during the Manhattan Project. The design was based on the success of Enrico Fermi's "Chicago Pile I" in December 1942 and a pilot plant, the X-10 graphite reactor, in Oak Ridge, TN that began producing plutonium in November 1943.

B Reactor was a 36-foot cube built of graphite blocks with a matrix of holes for process tubes that held the uranium fuel rods. With safety a paramount concern, nine horizontal control rods and 29 vertical safety rods were inserted to adjust or shut down the reactor.

B Reactor was designed to produce 250 million watts, more than a million times the Chicago Pile I. There was no time to build another pilot plant or rigorously test engineering solutions to the many first-of-a-kind problems. DuPont engineers had to work quickly to translate the Chicago physicists' ideas into blueprints to keep ahead of the construction crews at Hanford.

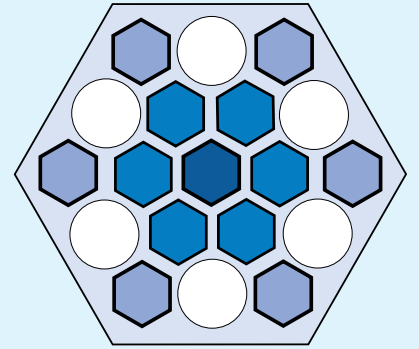


The fuel elements were loaded into the front face of the reactor. At full capacity, workers had to load over 60,000 fuel elements into the reactor's 2,004 process tubes. After an average of 100 days in the reactor, a fuel element would be sufficiently irradiated to be removed. The fuel elements were ejected from the rear face of the reactor where they fell into a 20-foot pool of water. Here they cooled off for about 90 days until they were ready to be loaded into a lead-lined cask car and transported by train to the chemical separations plants about ten miles away.

~From the Atomic Heritage Foundation's A Guide to the Manhattan Project in Washington

Greetings from the Atomic Heritage Foundation!

The Atomic Heritage Foundation (AHF) was founded by Cynthia C. Kelly in 2002. Located in Washington, DC, the nonprofit organization, is dedicated to the preservation and interpretation of the Manhattan Project and its legacy.



AHF's long-term goal has been to create a Manhattan Project National Historical Park, with legislation now pending before Congress. The new park will have sites at Los Alamos, NM, Oak Ridge, TN and Hanford, WA. AHF has been working to preserve properties in all three sites [see photos below]. In addition, AHF's new website, "Voices of the Manhattan Project," now has over 120 oral histories with plans to add over 400 more, including 175 now in private and university archives. These oral histories will be invaluable for the interpretation of the Manhattan Project in the future.



Atomic Heritage Foundation staff and Cindy Kelly (right)



The Oppenheimer House at Los Alamos



The historic Alexander Inn at Oak Ridge



The control room of the B Reactor

Current AHF Projects



VOICES of the **MANHATTAN PROJECT**

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Voices of the Manhattan Project

Voices of the Manhattan Project is a joint project by the Atomic Heritage Foundation and the Los Alamos Historical Society to create a public archive of our oral history collections of Manhattan Project veterans and their families. The Manhattan Project was a great human collaboration, with 130,000 people around the country working on the top-secret project. We are currently in the process of adding many more oral histories to the website, so check back frequently to view new interviews!

We are still conducting interviews with Manhattan Project veterans and their families, to capture as many oral histories as possible. If you are, or know, a Manhattan Project veteran who would like to be interviewed, please [contact us](#).



Preservation

- Promoting legislation to establish a Manhattan Project National Historical Park at Hanford, Oak Ridge, and Los Alamos. House passed HR 1208 as an amendment to the National Defense Authorization Act in June; the 113th Congress may pass final legislation this year
- In collaboration with the B Reactor Museum Association and others, working to preserve the “signature facilities” of the Manhattan Project at Hanford, Los Alamos, and Oak Ridge
- Special preservation projects include the Gun Site at Los Alamos and the Bruggeman Ranch House and White Bluffs Bank at Hanford

Interpretation

- Collecting oral histories for our “Voices of the Manhattan Project” website (manhattan-projectvoices.org) to create a central repository and directory for oral histories
- Creating interpretive models and displays for the B Reactor at Hanford, WA
- Producing video vignettes on Hanford’s history and role in the Manhattan Project
- Designing a traveling exhibit on the Manhattan Project to be featured in history and science museums nationwide for the Manhattan Project’s 75th anniversary in 2017

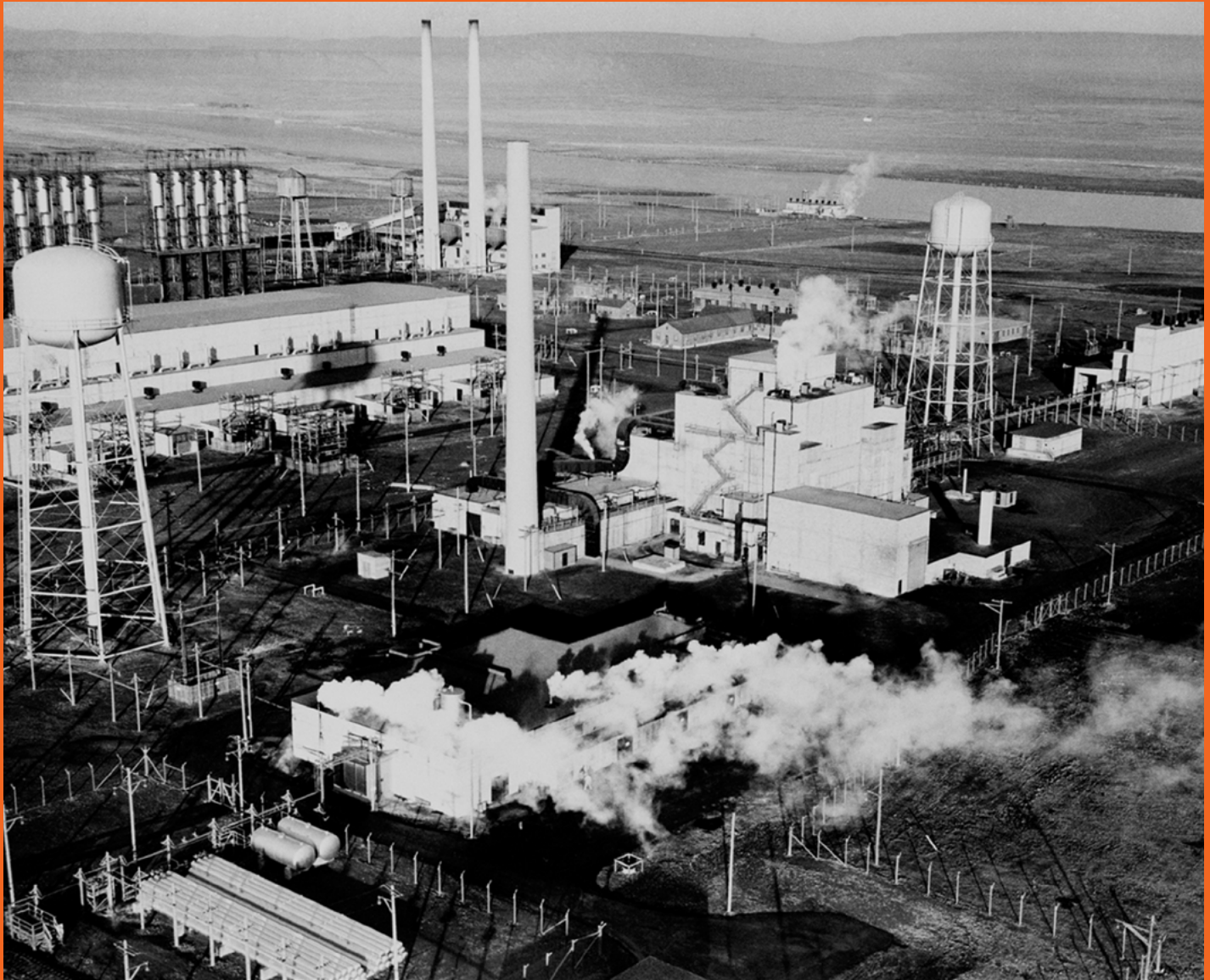
Education

- Developing comprehensive Manhattan Project online resources and an Atomic Wiki
- Published four site-specific guides and planning a comprehensive guide to the Manhattan Project (2014)
- Daily updates on the Manhattan Project (Facebook and Twitter)

To support our efforts, please contact AHF President Cindy Kelly at ckelly@atomicheritage.org or 202-293-0045 or visit AHF’s website, www.atomicheritage.org.

Thanks very much to Watson Warriner, his daughter Betsy W. Dean, and their family for their generous contribution that made this pamphlet possible.

Thanks to "Trains" magazine for granting permission to reprint Watson C. Warriner's "Journey to Destiny" article, which originally appeared in the August 1995 issue.



The B Reactor and support facilities during the Manhattan Project

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