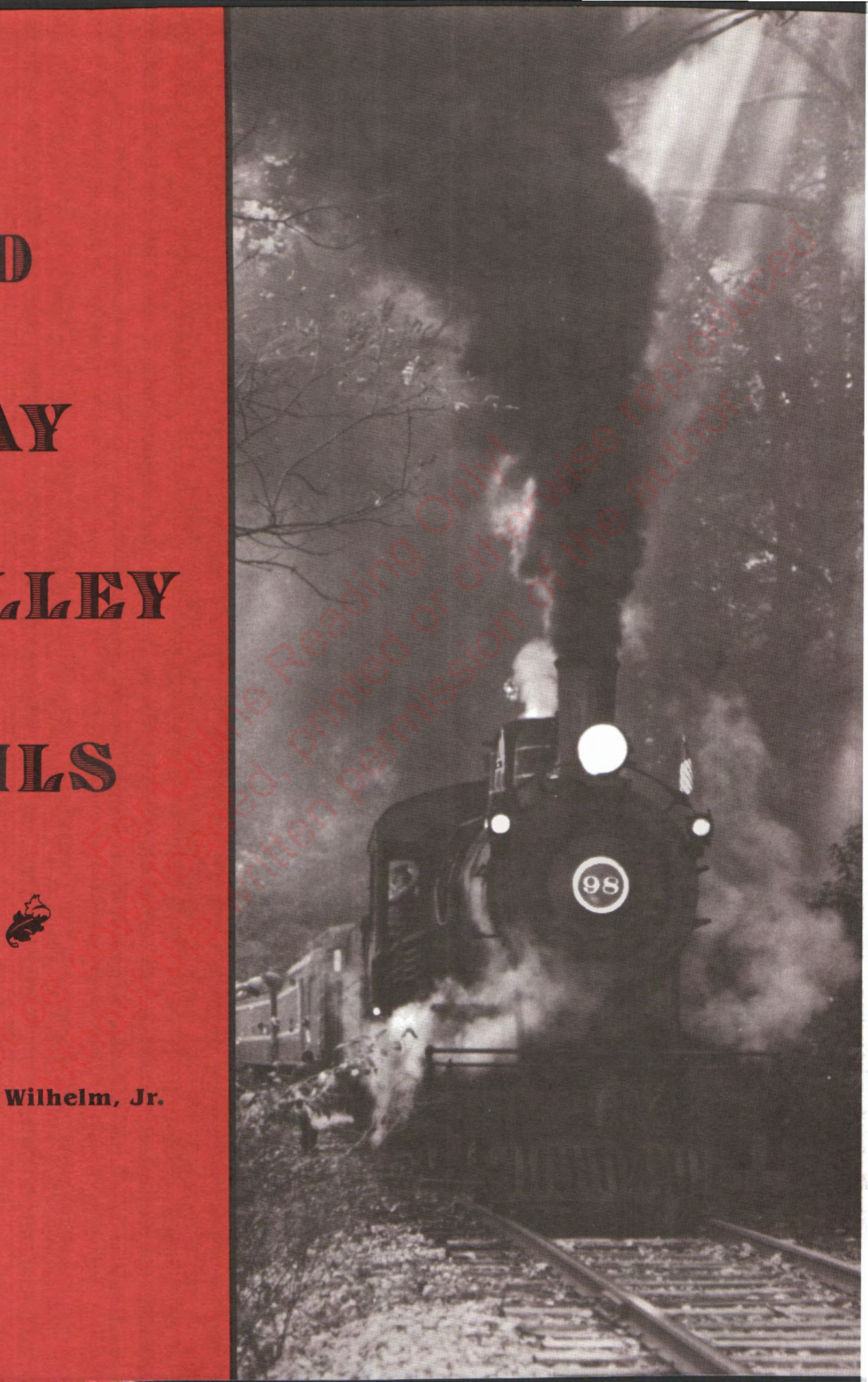
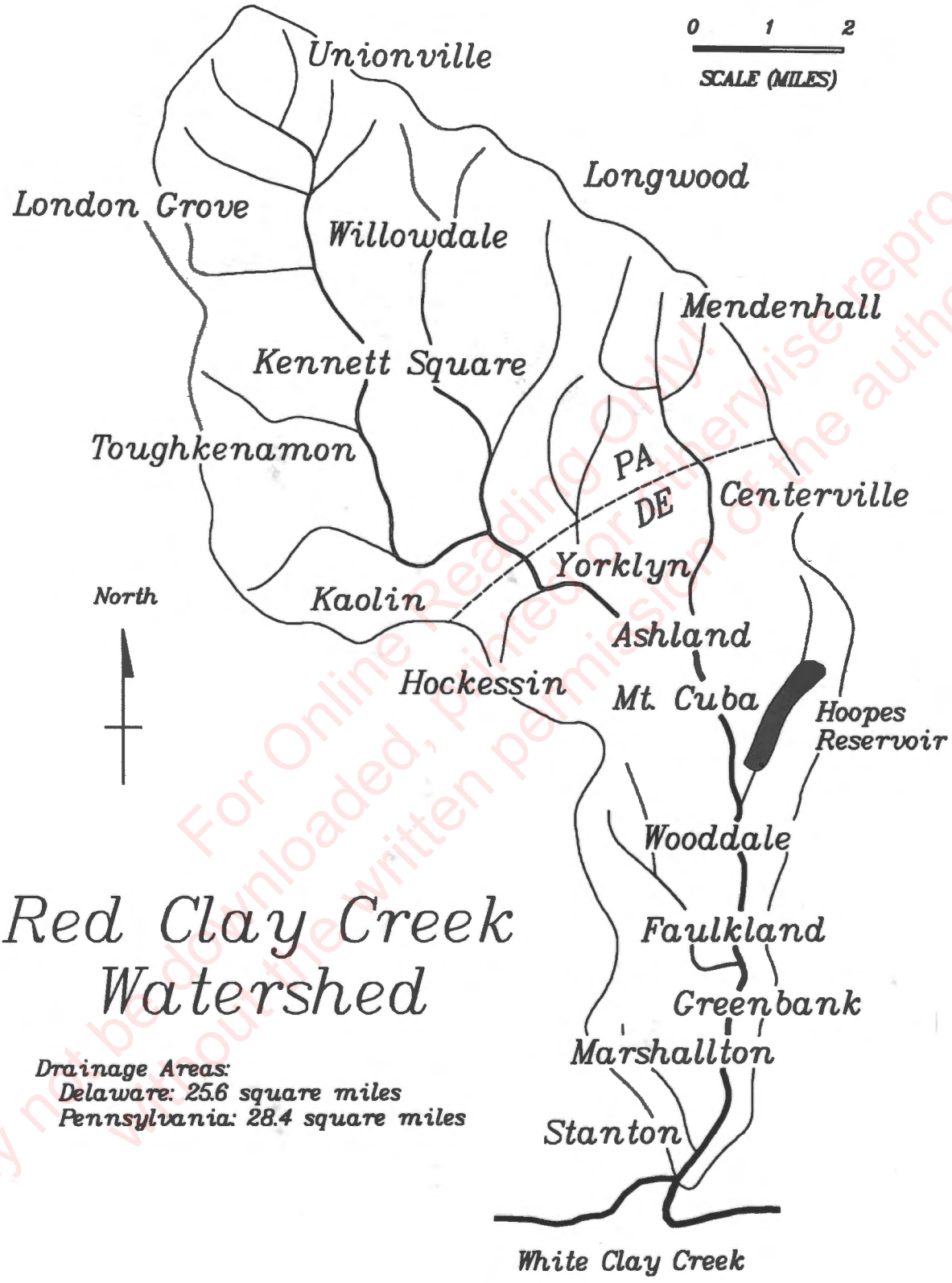
RED CLAY VALLEY RAILS



Robert E. Wilhelm, Jr.

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Red Clay Valley Rails

by

Robert E. Wilhelm, Jr.

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published by

Historic Red Clay Valley, Incorporated

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This booklet is dedicated to the author's grandfather,
William B. Dudkewitz



The author's grandfather, William B. Dudkewitz, enjoys lunch on the rear of B&O Caboose C2203 on October 25, 1947 at Yorklyn Water Tower. Born in Galicia, Austria, Bill came to the United States with his parents in December 1907 at the age of nine. He married Julia Sypa in 1920 and shortly thereafter moved to Philadelphia so that he could work for the Baltimore & Ohio Railroad. Working his way through the ranks to eventually become an engineer, his entire career was spent working on the B&O's Philadelphia Division. In 1925 he moved to Richardson Park, Delaware where he and Julia started a family. Eventually raising six children, he moved to a small farm a short distance from Greenbank. As an engineer for the B&O, he spent his later years assigned to Wilsmere Yard and for many years brought trainloads of freight to the businesses along the Landenberg Branch. He retired from the B&O in the early 1960's after 43 years of service shortly before Historic Red Clay Valley, Incorporated started operating steam powered passenger trains on the line.

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Thanks

There are a number of individuals that made the creation of this work much easier. I am greatly indebted to Thomas C. Marshall, Jr., Melvyn (Skip) Small, Jr., and Richard E. Hall for providing me with much of the resource material used in this publication. Their dedication to Historic Red Clay Valley, Incorporated since its chartering in 1960 have been an inspiration to the author. The author would like to acknowledge Historic Red Clay Valley, Incorporated volunteers Maurice L. Cannon, Paul Fortin (a former Conductor for the B&O on the Landenberg Branch), David L. Hope, John M. Iwasyk, Joseph R. Lake, Jr., Evan E. Stauffer, Jr., and Alan Wedman for their many contributions, comments, and suggestions. With every publication there are always pieces of information that the author believes exist but seems never able to locate. I would like to thank Raymond Harrington, Mark Lawlor, and James Personti, for providing resource materials and information that I was unable to locate. The author is indebted to Watson F. Brown, Margaret O. Plank, and William S. Schenck for reviewing and providing assistance with some of the technical information included in this booklet. As the text for this publication neared completion, Kenneth J. Schwarz began the grueling task of proof-reading the initial draft. Ken is an avid railfan and fellow board member, and I can assure the reader that Ken's contributions have made this booklet easier to both read and understand. Finally, I want to thank both of my parents, Robert E. Wilhelm and Eva Dudkewitz Wilhelm, for their support and encouragement during the many months that I spent working on this booklet. From my mother I inherited railroad blood, and from my father the perseverance to tackle a project such as this.

Introduction

Creation of this booklet actually began several years ago when I started collecting notes of the various narratives that were being given on Wilmington & Western Railroad trips to Mt. Cuba and Hockessin. As a volunteer I wanted to provide narratives on some trips, but found that no formal notes existed from which I could work. The few people that were doing narratives all worked from memory or their own note cards. To remedy the situation I collected my notes, asked questions, and did some additional research. The product of my effort was a three-ringed notebook containing a detailed narrative written as a script that could be read by any traincrew member.

Once the narrative started being used, I found that not all of the information being presented was historically or technically accurate. New and sometimes more interesting information was occasionally provided by a passenger or another volunteer, and traincrew members commented that passengers often asked where they might find additional information. The narrative was revised and expanded to reflect new and corrected data that became available.

What resulted was a collection of information, all of which could not possibly by conveyed during a trip. In fact, the additions to the narrative made it a nearly continuous talk from the time the train left the station until it returned. Some passengers were beginning to want less talk and just the highlights. I decided that the best solution was to document the historical, cultural, geological, and industrial information that I was gathering in a booklet. I could then shorten the train narrative to include only the highlights.

As I needed a map to indicate locations along the railroad and Red Clay Creek, I turned to the B&O's Railroad Valuation Maps which had been drawn in 1918. I transcribed the information on the Red Clay's route and the railroad's right-of-way from the linen valuation maps to a computer generated map. As the narrative was already composed using a word processing program, all I needed to do was include the additional information that I was still accumulating. To complete the package, I added various photographs and did further interviews and research. The result is the booklet which you are about to read.



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No. 37
Every railfan has a favorite locomotive and No. 37 is the author's. Built in 1924 by the American Locomotive Company (ALCO) at their Brooks Works for the Sugar Pine Lumber Company of Fresno, California, this 2-8-2T originally carried the number 4. When Sugar Pine fell into bankruptcy, No. 4 moved to Scotia, California hauling redwood for the Pacific Lumber Company. Now identified as No. 37, this locomotive served Pacific Lumber until 1956 when diesels replaced it. In 1966 No. 37 moved east on a flat car to serve the Wawa & Concordville Railroad which offered tourist passenger service on the Wawa-Colora Branch of the Pennsylvania Railroad. When the line closed in 1968, the 2-8-2T sat on a Concordville siding until rescued by HRCV member Skip Small. Moved to Marshallton Yard in 1980, the Mikado returned to service on the WWRR in late 1987. Burning waste oil, this superheated saddle-tanker provides 35,200 pounds of tractive power and was designed for poor track and tight curves. Right, No. 37 crosses Wooddale Trestle while above No. 37 sits ready for a 1990 Santa Claus Special.

Those in Historic Red Clay Valley, Incorporated that have read and commented on the draft copies of this book are amazed at the wealth of history, industry, and culture that have occurred along a narrow band of New Castle County. Most Delawareans, and many surrounding state residents, are very familiar with the historical significance of the Brandywine River Valley. Hopefully this work will help to enlighten Delaware Valley residents, that in its own way, the Red Clay Valley played a very significant role in the development of New Castle County, the State of Delaware, and the surrounding territory. Historic Red Clay Valley, Incorporated will update this work as time passes and welcomes contributions to the contents of this booklet.

Robert E. Wilhelm, Jr.
May 1992

Prologue

Since its official organization in March of 1960, Historic Red Clay Valley, Incorporated has worked in many different ways to preserve the Red Clay Creek Valley, one of the three major watersheds in New Castle County, Delaware. Its efforts have included the formal publication of historical books and information; the ownership and operation of the 18-century grist mill at Greenbank; the ownership and operation of the 120-year-old Wilmington & Western Railroad line; numerous educational programs; and, most recently, participation in the Red Clay Creek Stream Stewardship program, administered by the Delaware Nature Society at Ashland.

The Wilmington & Western Railroad line has played a continuous and vital role in the life of the valley ever since its grand opening in October of 1872. After serving the Baltimore & Ohio Railroad Company as the 'Landenberg Branch' for nearly 100 years, the remaining 10 miles of track were purchased by Historic Red Clay Valley in 1982, thereby giving the reincarnated Wilmington & Western Railroad a permanent home. The railroad line, now one of only a few visible remains of the once bustling industrial and economic activity of the Red Clay Valley a century ago, serves as a living reminder of the rich history of the area.

Through the operation of its rare antique locomotives and coaches on the line, Historic Red Clay Valley strives to create an appreciation on the part of its visitors of the critically important role played by the Red Clay Valley and by the railroad line in the development of American industry. In addition to providing a firsthand experience of the sights, sounds and sensations of a bygone era, a trip on the Wilmington & Western creates a vivid impression of the importance of the creek to past generations as well as to the present.

Red Clay Valley Rails represents an important step for Historic Red Clay Valley, Incorporated in the dissemination of information about the Red Clay Valley, both past and present. After correcting and standardizing the narrative normally presented during Wilmington & Western Railroad excursions, the author decided to expand upon this rudimentary information and make it available in print for the many visitors who request additional information.

Far from being a dry scholarly treatise, however, **Red Clay Valley Rails** functions equally well as a practical 'tour guide' which can used to identify important sites along the railroad line during a trip on the Wilmington & Western, or as an eminently readable source of more detailed information for anyone fascinated with the rich heritage of the Red Clay Valley.

The Red Clay Valley and the Wilmington & Western Railroad line played a significant role in the economy of the Wilmington area following the Civil War, the era of America's great industrial expansion; they continue to play an important role as a natural and unspoiled haven in the midst of present-day suburban sprawl and as a vital source of drinking water. **Red Clay Valley Rails** is a significant contribution to the understanding of the importance of these roles.

Maurice L. Cannon
HRCV Executive Director
May 27, 1992



8408 - THE LANDENBERG BRANCH WORKHORSE

Without question 8408 has been the workhorse locomotive on the Landenberg Branch since HRCV purchased the line in 1982. As serial number 1106 this SW-1 switcher was one of 16 delivered to the B&O during August 1940. Manufactured at the General Motor's Electro-Motive Division in Chicago, and carrying the number 208, this six-cylinder locomotive delivers 49,500 pounds of tractive force. In February 1957 the number changed to 8408 when all 200-series numbers were changed to 8400-series numbers by the B&O. 8408 worked the line for the B&O, and HRCV purchased the engine with the branch for freight service use.

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LOCOMOTIVE No.98 - THE PRIDE OF THE WILMINGTON & WESTERN'S MOTIVE POWER STABLE

JOHN P. McLEAR, Treas. J. T. HEALD, Prest. W. H. CONNELL, Sec'y.

OFFICE OF

Wilmington & Western Rail Road Company.

Wilmington, Del., _____ 187

When the Philadelphia & Baltimore Central Railroad began operation in the mid-1850's, freight traffic to the Port of Wilmington began to decline. To help regenerate some of the port's business, the Delaware Legislature passed an Act on March 5, 1861 to create the Wilmington and Brandywine Railroad Company. However, increasing tensions between the North and South, and eventually the Civil War, caused this Act to be abandoned.

As industrial activities recovered after the War, interest in a railroad again peaked. In 1865 the Wilmington and Brandywine Railroad Company changed its name to the Delaware and Pennsylvania State Line Railroad Company. Later that year it merged with the Berks and Chester County Railroad to become the Wilmington and Reading Railroad Company. Originally planned to have routes along Red Clay Creek, Mill Creek, and the Brandywine River, only the rails that followed the Brandywine were completed. This left many water powered mills along both Red Clay Creek and Mill Creek without rail access.

Recognizing this fact was Joshua T. Heald, a very successful Wilmington businessman. He teamed up with J. G. Jackson, owner of a large limestone quarry in the center of Hockessin; William E. Garrett, owner and operator of Garrett Snuff Mills near Auburn (now Yorklyn); Alan Wood, owner of a steel rolling mill on the Red Clay Creek at Wooddale; George Springer, owner of several kaolin mines near Southwood; and Job H. Jackson, a Wilmington railroad equipment builder. Together they developed plans to construct a railroad between Wilmington, Delaware and Oxford, Pennsylvania.

To start the enterprise, the Wilmington and Chester County Railroad Company was incorporated by both the Delaware and Pennsylvania Legislatures on February 5, 1867. Selecting whether to follow Red Clay Creek or Mill Creek was one of the challenges Heald and his group faced. The Mill Creek route was 3 miles shorter than the Red Clay Creek route. This amounted to a $25,000 construction savings if the Mill Creek route were selected. However, Red Clay Creek businesses annually shipped 12,000 tons of materials at a cost of $36,000 per year verses the 6,000 tons of goods shipped at $6,000 per year for the Mill Creek businesses. When the Red Clay Creek route was finally selected, several mills moved from Mill Creek to Red Clay Creek. As part of several amendments to the railroad's charter by both the legislatures of Delaware and Pennsylvania in April 1869, the name of the railroad changed to the Wilmington & Western Rail Road Company.

Ground breaking for the new railroad occurred on the property of Fells Spice Mill a short distance from Brandywine Springs on July 8, 1871. Track laying started in earnest from both Wilmington and Landenberg using mostly local labor. Obstacles in the path of the new railroad included deep rock cuts that had to be made at Wooddale, Mt. Cuba, and later Landenberg. Much of the right-of-way would require fill to keep the grades to less than one percent except between Auburn (Yorklyn) and Hockessin where the grades would be between one and two percent for nearly a mile and a half. The final route of the railroad also required many smaller rock cuts and excavations to be done along the entire route. All of this work required the use of high explosives to blast the path loose so the rock could be removed, a dangerous and laborious job.

The route selected was alongside the Red Clay Creek for about 7 miles of the trip. This meant that many bridges and wooden trestles had to be constructed as the rails crisscrossed the creek. Outside Landenberg it was necessary to construct a trestle

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ENGINEER'S OFFICE

Wilmington & Western Rail Road,

Room No. 9 Exchange Building,

Wilmington, Del., ... *187*

at Broad Run, a tributary of the White Clay Creek. This trestle became a landmark for the road as it spanned 885 feet and towered 60 feet above Broad Run Creek.

Saturday, October 19, 1872, a little over a year after construction began, the 19 mile long short-line celebrated the completion of construction and the start of regularly scheduled trains between Wilmington and Landenberg. A typical passenger train would leave Wilmington on its journey to Landenberg following rails that had been laid along Little Mill Creek. After passing the railroad's first station, a *flag* stop at Kiamensi named after the Kiamensi Woolen Mills, the train moved on past Marshall's Rolling Mill and headed towards the Phillips Spoke and Carriage Stuff Factory at Greenbank

Most trains stopped at Greenbank, one of the road's major stations. Leaving Greenbank the train would make its way past Brandywine Springs where ground breaking ceremonies had occured. Moving past the spice mills of C. J. Fell at Faulkland, the consist continued north crossing the Lancaster Turnpike (Route 48). Immediately beyond the turnpike was the road's largest rock cut at Wooddale. Another station was built at Wooddale as well as sidings to supply coal to the sheet iron rolling mills of Alan Wood. Mt. Cuba was the next stop along the line. Here a platform was built so city residents could enjoy the picnic area along the Red Clay Creek.

Leaving Mt. Cuba, the train headed for the station at Ashland near the Sharpless flouring and saw mills. The largest mills on the creek were next, those of William Garrett. Near Garrett's Upper Mill was another of the new railroad's stations, Yorklyn Station. From here the line left the Red Clay Creek

BROAD RUN TRESTLE
The Broad Run Trestle was 885 feet long and towered 60 feet above the Broad Run Creek in Pennsylvania. It was dismantled in 1942.



LETTERHEADS
The letterheads at the top of Pages 8, 9, and 10 are from original Wilmington & Western Rail Road stationary.

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Wilmington & Western R. R. Co.

Wilmington, Del., _____ 187

Valley, moved past the large kaolin factory belonging to the Diamond State Kaolin Company, and entered the Hockessin Valley. Near the limestone quarries of John G. Jackson and those of Springer and Thompson was Hockessin Station. Leaving Hockessin Station, the train proceeded west to Southwood Station, (actually a small shelter shed and not an actual station), the line's last stop in Delaware. At the Delaware-Pennsylvania border a cut was made through a rich deposit of soapstone at Brown's Summit.

Beyond was the expansive Broad Run trestle, a breathtaking event for all passengers. The first depot in Pennsylvania followed and was named for the Broad Run Creek. Broad Run Station was another shelter-shed type station. Finally, after a moderate climb, the train rounded a curving rock cut and found itself high on the side of a steep grade following the White Clay Creek over one hundred feet below. Passing over a short high trestle and past the turntable for the Landenberg enginehouse, the tracks ran parallel to the Pomery & Newark tracks (later purchased by the Pennsylvania Railroad) and into Landenberg.

When the new railroad started operations in 1872 the motive power consisted of four Baird and Company locomotives. During a typical day an engine would devour about 20 tons of soft coal, all hand shoveled into the firebox. Additionally an average of 20,000 gallons of water were turned into steam to feed the locomotive's two 17 inch diameter by 24 inch stroke cylinders that powered the 62 inch drive wheels. The railroad owned three, first-class passenger coaches and two smoking cars. They were manufactured by Harlan and Hollingsworth Company in Wilmington and were equipped with oil lamps for lighting, and soft coal burning pot-bellied stoves. Freight rolling stock of the company consisted of two mail cars, ten box cars, ten gondolas, and ten flat cars.

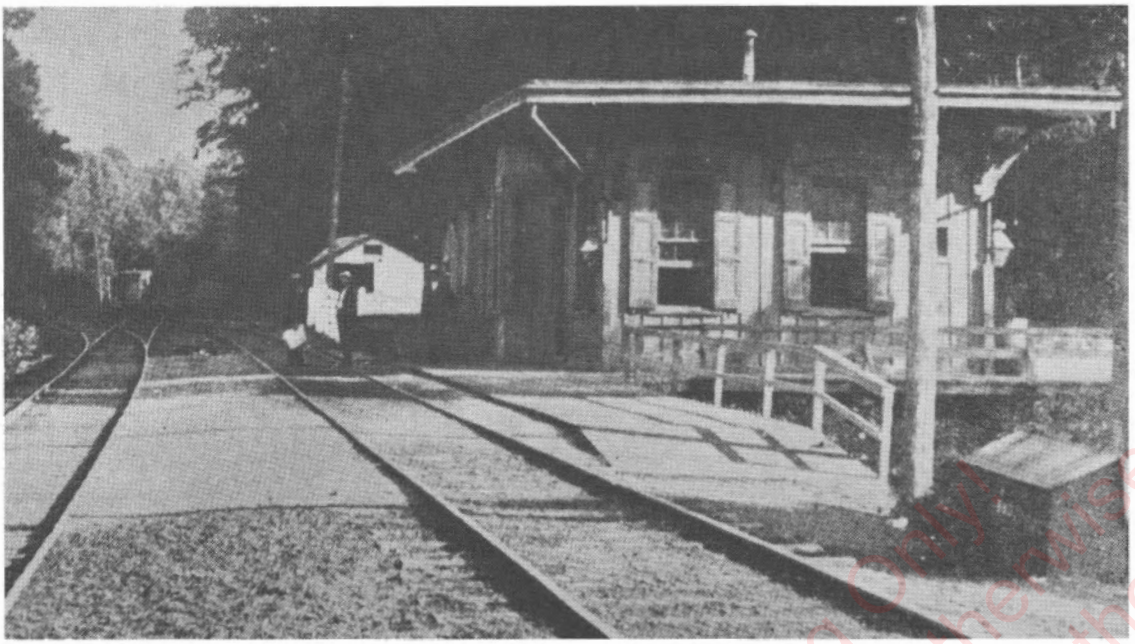
The line operated a telegraph system between Landenberg and Wilmington that interconnected all of the railroad's stations. Arrangements were secured with the Western Union Telegraph Company to dispatch messages to and from all parts of the United States. Post offices were established at Landenberg, Hockessin, Yorklyn, Wooddale, and Faulkland.

There was a large engine house on Lower Oak Street in Wilmington, as well as the main station and company offices at the intersection of South Market Street and C Street. Near C Street and New Castle Avenue a 'Y' track arrangement was laid to permit locomotives and trains to be reversed without the need to travel to the Wilmington engine house turntable. In Landenberg a second smaller two-bay enginehouse was constructed. In front of the Landenberg enginehouse a 60 foot diameter turntable was built to turn locomotives and to provide access to the enginehouse. Water tanks were at Wilmington, Yorklyn, and Landenberg.

The early revenues generated were not enough to pay the interest payments on more than eight hundred thousand dollars worth of bonds and loans used to finance construction. Foreclosure occurred in April 1877 and the company was reorganized as the Delaware Western Railroad Company. While the Delaware Western Railroad became highly profitable, a purchase offer by the Baltimore & Philadelphia Railroad (B&P) in February 1883 was too good to refuse.

The Baltimore & Ohio Railroad (B&O) had just lost out on a bid to purchase the Philadelphia, Wilmington, & Baltimore Railroad (PW&B). Purchase of the PW&B would have provided the rails necessary to begin freight and passenger service between Washington, Baltimore, Philadelphia, and New York. When the B&O lost the bid, the B&O's management formed the B&P Railroad to connect Baltimore with Philadelphia. The B&P purchased

Red Clay Valley Rails, Reading & Northern Railroad
Wilmington, Delaware
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LANDENBERG STATION IN 1900
Landenberg Station was the western terminus for the line. Here the tracks of the Wilmington & Western Rail Road (right) connected with the tracks of the Pomery & Newark Railroad (left). Landenberg Station was demolished in 1942 when the Baltimore & Ohio Railroad removed the tracks between the Delaware-Pennsylvania State Line and Landenberg.

controlling interest in the Delaware Western in February 1883. Over the next several years main line tracks were constructed between Baltimore and Philadelphia. After the tracks were in service between the two cities, the B&P turned over all operations on their line to the B&O in 1886.

Many freight and passenger trains passed over the rails between Landenberg and Wilmington. The B&O named the junction near Marshallton, Delaware where the former Delaware Western tracks branched from the B&O's main line tracks, West Junction. It was not long before the route to Landenberg became known as the *Landenberg Branch of the B&O* by B&O passengers and train crews. This fourteen mile long branch was the B&O's most profitable branch for many years and connected with the Pennsylvania Railroad (formerly the Pomery & Newark Railroad) in Landenberg. However in the 1920's the profitability of the branch began to decline. In 1931 passenger operations were discontinued. In 1942 the track between Southwood, Delaware and Landenberg was abandoned. During 1957 the branch was shortened to Mill Creek just west of Valley Road in Hockessin.

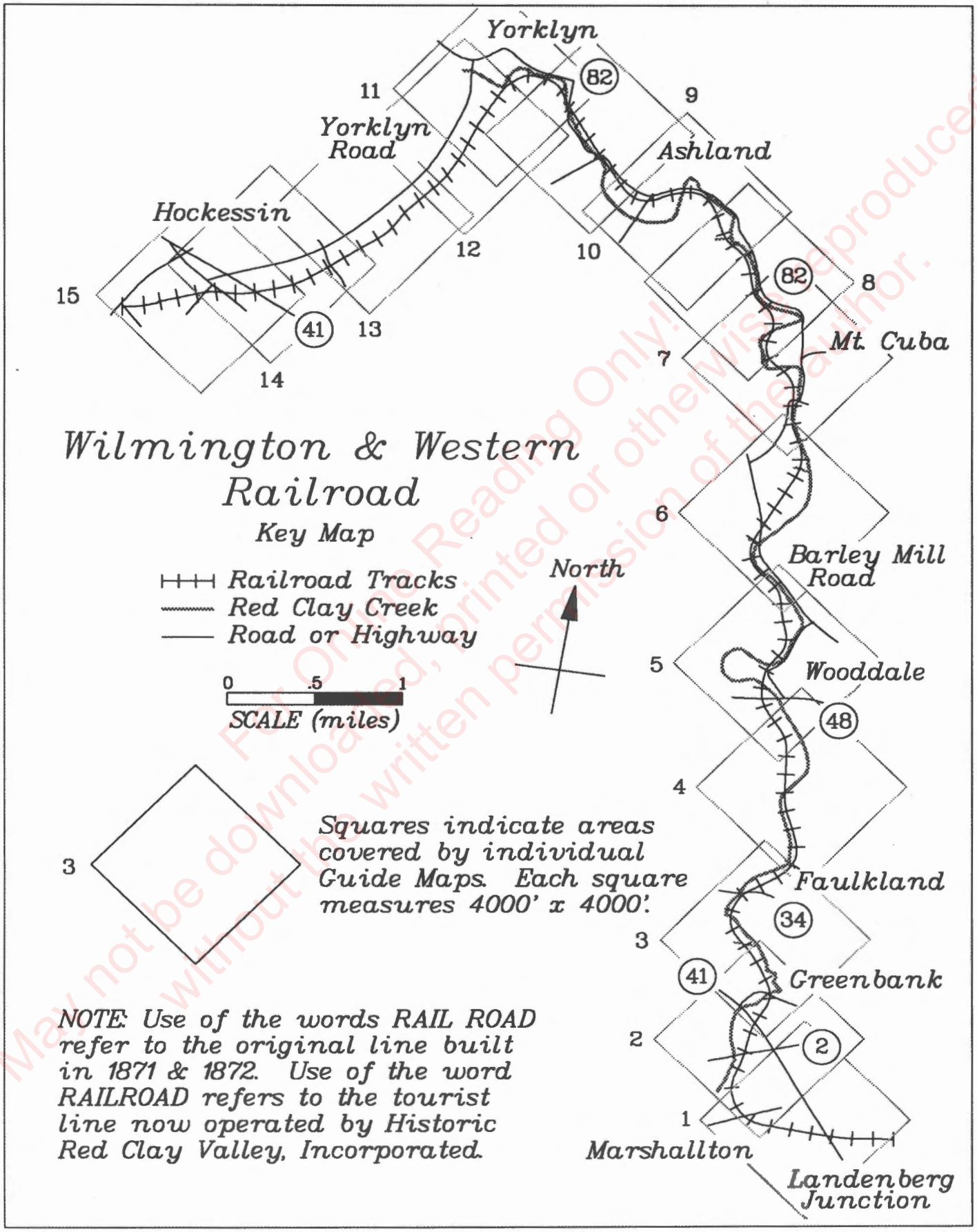
In 1966 the B&O leased the line to Historic Red Clay Valley, Incorporated (HRCV). Steam locomotives carrying the livery *Wilmington & Western Railroad* traveled the Landenberg Branch during the summer months between Greenbank and Mt. Cuba. On September 9, 1967 HRCV operated the first steam powered passenger train in many years to Hockessin. B&O freight trains operating during the week shared the Landenberg Branch with passenger trains pulled by a coal burning steam locomotive on weekends and holidays.

With a continuing decline in freight traffic during the 1970's, the branch began to loose money for the B&O and abandonment looked imminent. Now there were ten Wilmington & Western Railroad trains each week operating on a regular schedule for six months during the year while the B&O was only operating three freights each week! HRCV was beginning to operate more trains along the Landenberg Branch than the B&O was!

To save the line, HRVC began a fund raising effort to purchase the branch from its owners. While the fund raising efforts were underway, the B&O Railroad merged with the Chessie System. On June 24, 1982, Historic Red Clay Valley, Incorporated signed a purchase agreement with Chessie for the 10.2 mile Landenberg Branch. August 13, 1982 was the last day that locomotives displaying the B&O/Chessie livery operated on the Landenberg Branch since they first appeared in 1886! On September 19th, HRCV staged a gala celebration in honor of the purchase of the Landenberg Branch.

With purchase of the line, Historic Red Clay Valley, Incorporated not only owned rolling stock and locomotives displaying the Wilmington & Western Railroad livery, but HRCV now owned the original trackage right-of-way that was purchased by the Wilmington & Western Rail Road over one hundred years prior. Today thanks to a dedicated group of volunteer railroad enthusiasts, iron horses still graze the Red Clay Valley's rolling meadows and dale.

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NOTE: Use of the words RAIL ROAD refer to the original line built in 1871 & 1872. Use of the word RAILROAD refers to the tourist line now operated by Historic Red Clay Valley, Incorporated.

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1 LANDENBERG JUNCTION

In the mid-1800's the Pennsylvania Railroad (PRR) and the Baltimore & Ohio Railroad (B&O) were both providing service to New York City. The two railroads were using different routes and both relied on agreements with smaller railroads for access into New York. During the 1870's the PRR was able to purchase the necessary connecting railroads and make its New York route more secure. The B&O had not employed the same business strategy, and eventually recognized it might loose much of its New York business to the PRR. One of the B&O's problems was that the B&O had not purchased any right-of-way directly to New York. The B&O was still relying on track agreements with other railroads to connect Washington, Baltimore, Wilmington, Philadelphia, and New York.

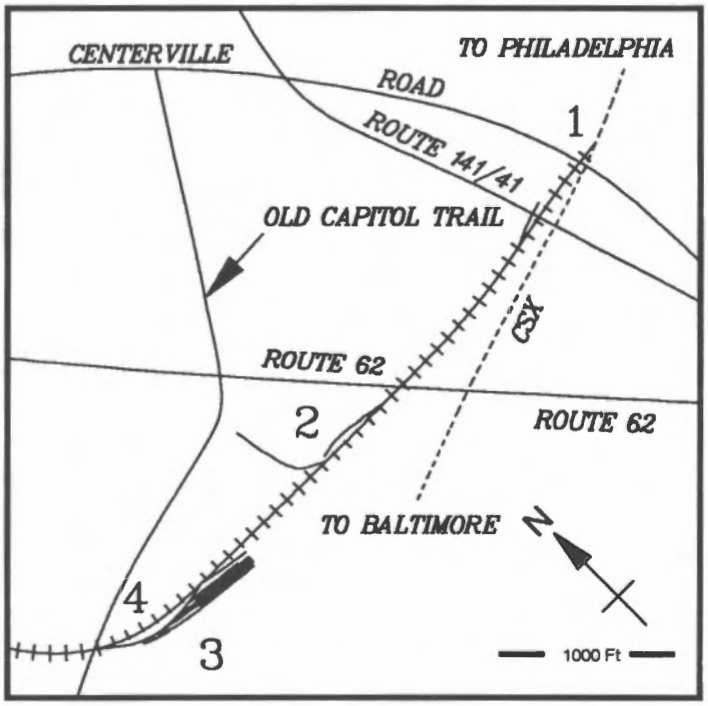
Connecting Philadelphia and Baltimore was the Philadelphia, Wilmington, and Baltimore Railroad (PW&B) which was one of the railroads used by the B&O in getting to New York. When the PRR began to swallow up the smaller railroads as part of its plan to conquer the New York City rail business, the PW&B saw the possibility that its Washington to Philadelphia route might be useless in several years if the PRR decided to build a parallel line. The PW&B decided to sell while they still could and arrangements were discussed with the B&O.

The B&O recognized that purchase of the PW&B would give them an immediate advantage over the PRR, and an easy means to achieve their goal of connecting Washington and New York. Initially the PW&B accepted the B&O's purchase offer, but when the Pennsylvania Railroad produced a better offer, the B&O's offer was rejected. The Pennsylvania Railroad, in purchasing the Philadelphia, Wilmington, & Baltimore Railroad had just about locked out the B&O as a competitor unless the B&O could find an alternate route between Washington and New York. To carry out the B&O's plan, a new route north or south of the PW&B tracks through Delaware was necessary.

While the Pennsylvania Railroad and the Baltimore & Ohio Railroad were concentrating on larger railroad companies in their bid to operate to New York, events were happening in Delaware that would make a twenty mile shortline railroad a key player in developing competitive rail service to New York. The Wilmington & Western Rail Road, chartered in 1867 and opened for operation in 1872, had fallen into receivership in 1877. Reorganized as the Delaware Western Railroad (DWRR), the line was becoming profitable hauling limestone, kaolin clay, snuff, tobacco, coal, iron, steel, and other materials between Wilmington, Delaware and Landenberg, Pennsylvania. One of the company's assets was the right to build additional track in Delaware. This asset was more valuable to the B&O than the profit the little shortline would make for the B&O.

A controlling interest in the Delaware Western Railroad was obtained in 1883 by the Baltimore & Philadelphia Railroad (BPRR), a company controlled by Baltimore & Ohio Railroad interests. The BPRR began immediate construction of tracks across Delaware and Maryland. In planning the new route, railroad right-of-way was purchased so that rails originating in Baltimore joined with the Delaware Western Railroad already in place from Landenberg. By mid-1886 construction of the 59.38 mile line between Baltimore and Philadelphia was complete. On September 19, 1886 the Baltimore & Ohio Railroad took over operation of the Baltimore & Philadelphia Railroad.

The B&O named the junction point where the new main-line track from Baltimore connected with the track to Landenberg, *West Junction*. West Junc-



MAP #1 - INTERCHANGE to MARSHALLTON

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tion is located at milepost 30.4 on original B&O track maps showing that the junction was 30.4 miles from Park Junction, Philadelphia, Pennsylvania. Park Junction marked the starting milepost for the Philadelphia Division of the B&O which the Landenberg Branch was part of. The Philadelphia Division was the name used by the B&O for the tracks of the Baltimore & Philadelphia Railroad.

Over time the tracks to Landenberg became known as the *Landenberg Branch* of the B&O to railroad employees and the public. Slowly the name West Junction fell into disuse and *Landenberg Junction* became favored. Landenberg Junction became the name for the starting point of 14.3 miles of branch line trackage that ended in Landenberg, Pennsylvania. In Landenberg the B&O tracks connected with the Pomery & Newark Railroad that eventually was purchased by the Pennsylvania Railroad.

Today the Landenberg Junction interchange is at the west end of CSX's Wilsmere Yard. Both the terms *Landenberg Junction* and the *Landenberg Branch*, stayed with the line when the Baltimore & Ohio Railroad merged into the Chessie System. Even after purchase of the Landenberg Branch by Historic Red Clay Valley, Incorporated (operator for the Wilmington & Western Railroad) in 1982, the name still refers to the tracks that once carried B&O passengers and freight to Landenberg, Pennsylvania.

In 1980 the Chessie System and the Seaboard Rail System merged into CSX Corporation. In addition to railroad operation, CSX Corporation includes American Commercial Barge Lines that operate barges along 10,000 miles of inland waterways, Sea-Land Service Incorporated that operate more than 60 container ships serving 80 ports in 70 countries, and CSX Intermodal that offers coast-to-coast containerized and piggyback trailer shipping. To provide better customer focus, the rail systems of CSX Corporation were combined into CSX Transportation, Incorporated. Railroads that are part of the CSX family include the Baltimore & Ohio Railroad, the Chesapeake & Ohio Railway, the Atlantic Coast Line Railroad, the Louisville & Nashville, the Central Railroad of Georgia, the Western Maryland, and the Seaboard Air Line.

Often called simply CSX, the 150,000 car railroad manages the nation's largest rail car fleet. CSX is the world's largest coal transporter, however their cars also carry more than one billion bushels of grain each year. The heart of CSX Transportation is a 20,000-mile rail network providing coverage of the Midwest, South, and mid-Atlantic regions. CSX serves more ports than any other rail carrier and has terminal locations in the major cities of 19 states, the province of Ontario, and the District of Columbia.

Landenberg Junction is still a railroad junction for CSX, the current owner of the former Chessie/B&O tracks connecting Philadelphia and Baltimore. The 1,200 feet of track located between the Landenberg Branch switch and Route 62 is called an interchange track. An interchange track is a section of track that is common to two railroads, in this case both Historic Red Clay Valley, Incorporated (HRCV) and CSX Transportation. The land belongs to CSX, but the railroad track belongs to HRCV.

Landenberg Junction provides the Wilmington & Western a unique interchange point not only with CSX, but with Conrail and Amtrak as well. At the east end of CSX's Wilsmere Yard are interchanges with both Conrail and Amtrak. By simply traversing Wilsmere Yard with the assistance of a CSX crew, Wilmington & Western trains can reach both Conrail and Amtrak rails. For many years Wilmington & Western steam powered trains have run to the Wilmington Train Station as part of National Transportation Week to sit alongside modern coaches that operate daily on Amtrak's Northeast Corridor. On occasion Wilmington & Western coaches have taken Conrail tracks south to Harrington, Delaware.

In addition to operating steam powered passenger trains along the Landenberg Branch, HRCV also handles freight cars to various customers on the branch line. Freight cars requiring delivery to HRCV freight customers are placed on the interchange track by CSX. A Wilmington & Western locomotive picks up the loaded freight cars and delivers them to the designated customer(s). Once loaded or unloaded by our customer(s), the Wilmington & Western then returns the cars to the interchange for return handling by CSX.

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2 FREIGHT SIDINGS

When the original Wilmington & Western Rail Road operated between Landenberg and Wilmington there were many sidings along the railroad's 19.8 mile length. Each of the major stations included a siding that allowed for the loading and unloading of freight. As the railroad changed owners and expanded through the years many more sidings were added while others were removed depending on business conditions. Sidings could be from several hundred feet in length, to a couple thousand feet in length, depending on the distance needed by a customer. Most sidings were not owned by the railroad but were owned by the business that shipped over the railroad.

Today only a handful of sidings remain. The Delaware Brick Siding is located within several hundred feet of Landenberg Junction and is used for the delivery of bulk shipments of brick. Two sidings are west of Route 62. The shorter of the two originally served the M&M Toy Company. The longer siding served the E. J. Hollingsworth Company and was used for the delivery of coal and lumber. Both sidings are now used for Wilmington & Western rolling stock storage. The Wilmington & Western's Marshallton Yard has five active sidings.

There are other sidings along the Wilmington & Western that are not used for freight shipments, but are used by the railroad as temporary storage sidings for track maintenance equipment and rolling stock. These storage sidings include two at Hercules Research Center, and one each at NVF in Yorklyn and in Hockessin Yard. There are two out-of-service sidings at the Haveg Division of Ametek, and one at NVF in Yorklyn.

During the history of the Landenberg Branch there have been sidings at Greenbank Station (1), Kiamensi Spring Water (1), Faulkland Station (1), Wooddale Rolling Mills (1), Wooddale Station (1), Wooddale Quarry (1), Mt. Cuba Station (1), Mt. Cuba Picnic Grove (2), Ashland Station (1), Garrett Snuff Mills (3), Yorklyn Station (1), Goldings Quarry (1), and in Hockessin (1). Before the tracks were removed west of Hockessin there were freight sidings in Southwood, Delaware and in Pennsylvania at Eden, Broad Run, and Landenberg. In 1888 the B&O listed the branch as 14.3 miles long with 2.5 miles of sidings.

3 MARSHALLTON YARD AND ENGINEHOUSE

Marshallton Yard is the main yard for the Wilmington & Western. There are five sidings and a passing siding that may be used to switch freight and passenger cars. Two of the sidings in the yard are used for outdoor rolling stock storage. Another pair of sidings enter the enginehouse and run the entire length of the building. Both of these covered sidings are used to store Wilmington & Western locomotives, Lackawanna Coaches, and cabooses out of the weather. We believe that the Wilmington & Western is the only



FREIGHT MOVE Wilmington & Western SW-1 diesel locomotive #8408 usually switches freight. However, enginecrews never pass-up an opportunity to use one of the railroad's steam engines. #37 is removing two empty box cars while two full box cars of brick (right) wait to be placed on Delaware Brick's siding.

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tourist railroad east of the Mississippi River that can store its normal operating rolling stock under a roof protected from the weather. The remaining siding is used as an outdoor locomotive and coach maintenance siding by the Wilmington & Western's Mechanical Department.

The original 235 foot enginehouse building was built in early 1965. This building was later expanded to the present 387 foot structure in late 1966. One of the two yard sidings that enter the building ends over a long pit. A feature of the pit is the ability to drop a short section of rail below track level. This feature permits a pair of wheels and their axle to be lowered from a locomotive for servicing. The concrete pit area also provides the Mechanical Department with a place to service and inspect the underside of coaches and locomotives.

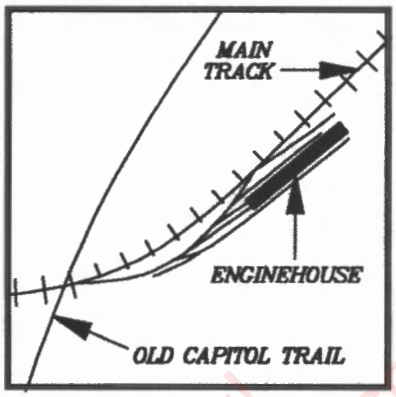
4 KIAMENSI STATION

When the original Wilmington & Western Rail Road was built, the first station on the line leaving Wilmington was named *Kiamensi Station.* This station was erected where the railroad crossed Old Capitol Trail. After the B&O purchased the line, a new station was built on the main-line tracks 1.2 miles south of Landenberg Junction in 1887. This new station was named Kiamensi Station as it was located in the community of Kiamensi, Delaware just off Kiamensi Road. The name of the original Wilmington & Western Rail Road station at Old Capitol Trail was changed to *Marshallton Station* in 1887 to reflect that the community was now calling itself Marshallton.

5 MARSHALL ROLLING MILLS

The construction date for the first mill located on the Marshall Rolling Mill site is unknown. History shows the mill was owned by Solomon Hersey until 1801 when he willed it to his two sons after he died. The brothers put the mill up for rent in 1813, advertizing a capacity of 2,000 barrels of flour per season. From 1818 until 1835 the mill had several owners until John Marshall purchased the mill. John Marshall was born in Chester County and was the son of Robert Marshall a grist mill operator. The family's grist mill was located near a fork in the Red Clay Creek just over the Delaware-Pennsylvania border.

After purchasing the mill, John and his brother Caleb wasted little time in building a rolling mill on the premises. The new rolling mill was one of the earliest in the country. Designed to produce galvanized iron, the mill site was named Marshall Rolling Mills. When Caleb returned to Chester County to operate the mills there, John and his wife continued operating the rolling mill. John Marshall's wife was a daughter of John C. Philips who operated Greenbank Mill between 1830 and 1852. Later, in 1845, Caleb returned to operate the Marshall Mills so John could help his father-in-law at Greenbank Mill.



MARSHALLTON YARD

By 1880 the community surrounding the mill had adopted the name Marshallton. In the same year the J. Marshall Company was producing 700 tons of galvanized iron using a patented process. After two expansions, the second occurring in 1884, the mills reached capacity of 2,500 tons per year. Now known as the Marshall Iron Company, the mill continued to be a significant producer of galvanized iron into the early 1900's.

When the manufacture of galvanized iron ceased at Marshallton, the mill was used for the manufacture of vulcanized fiber. It was owned by Delaware Hard Fiber Company for many years before being sold to the Rupert Film Company. Today the buildings belong to the Haveg Division of Ametek.

For many years the B&O delivered supplies to the plant facilities at Haveg. When the Wilmington & Western purchased the Landenberg Branch in 1982 Haveg was a freight customer. In the mid-1980's Haveg stopped railroad shipments. The sidings into the plant have not been removed as Haveg may require rail freight shipments in the future.

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6 ROUTE 2 - ROBERT KIRKWOOD HIGHWAY

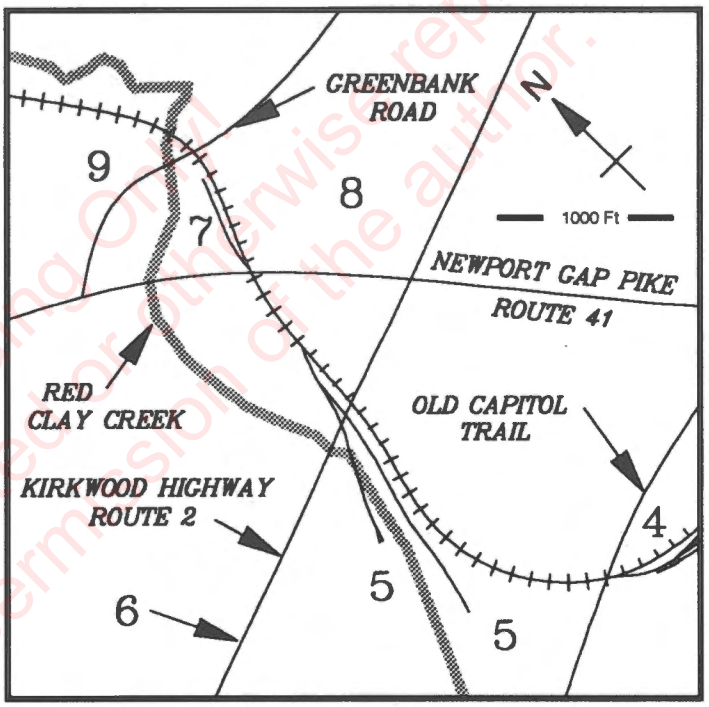
The tracks of Wilmington & Western Railroad pass under Route 2 which is also known as Kirkwood Highway. When the original road was built in 1700 it was called Lincoln Road. When the country's capital moved from Philadelphia to Washington, D.C. the road became known as the Capitol Road. A single lane road, it was the only route connecting Philadelphia and Washington, D.C. for many years. In the early 1900's the road was widened to two lanes and paved. About this time the name slowly changed to the Capitol Trail. As traffic increased on the portion of the road connecting Newark and Wilmington, it became necessary to make improvements. The road's path was changed and widened to four lanes to accommodate the traffic demand. The improved road became known as Route 2, the Kirkwood Highway. The remaining portions of the old road were renamed the Old Capitol Trail.

The Kirkwood Highway is named for a gallant Revolutionary War officer named Colonel Robert Kirkwood. Born near Newark, Kirkwood attended Newark Academy, a then well-known educational institution. He became a farmer and merchant, but enlisted in the army in 1776 when the Revolutionary War started. During his enlistment he achieved the rank of Major and was involved in 32 major battles. After the war, Kirkwood retired to Ohio. When conflicts broke out with the Miami Indians near Cincinnati, Ohio, he returned to active duty. Major Robert Kirkwood was killed in 1791 at the Battle of Miami near Cincinnati. After his death, in honor of his many accomplishments, leadership, and heroism, he was promoted to the rank of Colonel.

7 GREENBANK STATION

The Wilmington & Western's original station at Greenbank was erected in 1872. This station as well as ones in Wilmington, Faulkland, Mt. Cuba, Yorklyn, Hockessin, and Landenberg were the principal stations for the line. The line had smaller depots at Kiamensi (Marshallton), Ashland, Wooddale, Southwood, and Broad Run. The principal Wilmington & Western passenger stations were rectangular with flat roofs and shuttered windows. The Wilmington & Western's primary stations included a passenger waiting area, a window where mail and telegraph messages were handled, and a baggage area.

The first freight shipment on the original Wilmington & Western Rail Road consisted of four kegs of nails shipped from D. H. Kent & Company. The kegs of nails were being shipped to Greenbank Mill and were delivered by the new railroad to Greenbank Station for pick-up by the Philips brothers, owners of the mill.



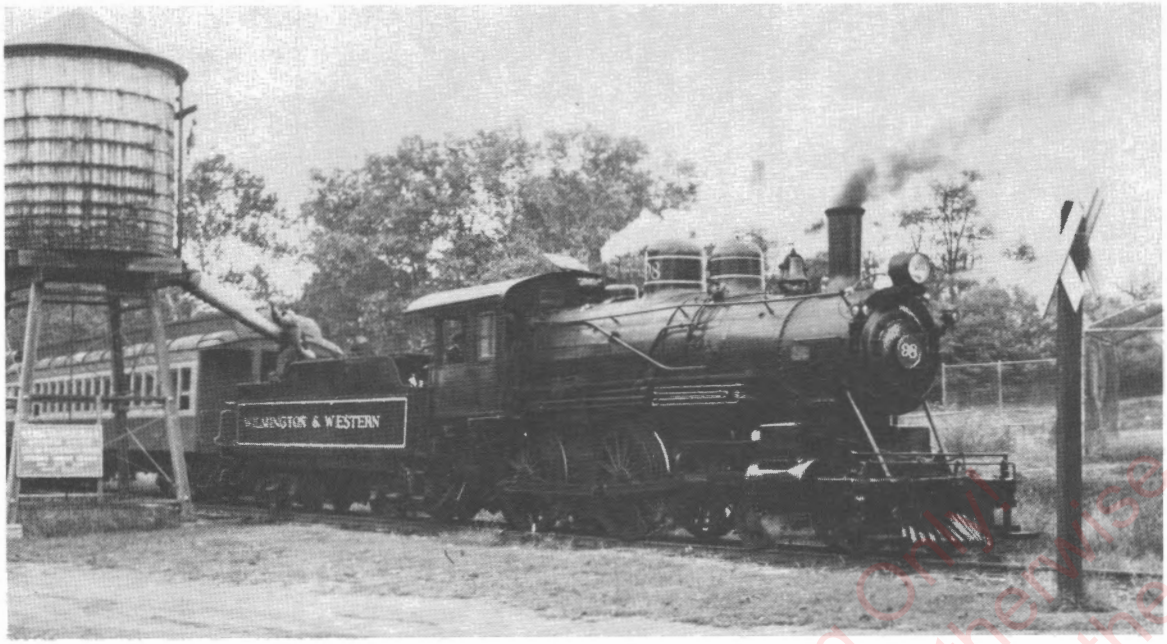
MAP #2 - MARSHALLTON to GREENBANK

The only original Wilmington & Western Rail Road station that remained when Historic Red Clay Valley, Incorporated began operating trains in 1966 was the wooden structure at Yorklyn. In March 1968 the Yorklyn Station, built in 1873, was moved to Greenbank to serve as a gift shop. While it is not known if all Wilmington & Western stations had basements, the Yorklyn Station was constructed with a basement.

The building that the Wilmington & Western uses as a ticket office and snack bar came from Kennedyville, Maryland. Known as *Kennedyville Station*, the building served the Pennsylvania Railroad. In the early 1960's HRCV obtained the Kennedyville Station building and relocated it to Greenbank.

Volunteers cut the building into sections in preparation for relocation to Greenbank. The sec-

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No. 98 TAKES A DRINK
Built by the American Locomotive Company in 1909 for the Mississippi Central Railroad, No. 98 pulled passenger varnish between Hattiesburg and Natchez, Mississippi. Pointed eastbound in this October 1972 photo at Greenbank Station, No. 98 was turned to face westbound a few months later.

tions were stored for about eighteen months until they could be moved forty-five miles to Greenbank. Once back at Greenbank a crew of volunteers reassembled the building and began restoration. An entire new roof was put on the building and the wood siding was replaced. After cleaning, interior repairs, and several coats of paint, the building was ready to serve the Wilmington & Western.

Before the building was dismantled at Kennedyville, it was larger than it currently is at Greenbank. The building at Greenbank is the size of the original Kennedyville Station building. When freight traffic increased at Kennedyville, a freight house was built behind the station. Years later, after freight traffic had declined, the freight house was torn down and a freight room was added to the end of the Kennedyville Station building. HRCV did not relocate the freight room portion of the building to Greenbank with the rest of the structure. The side door of the building, behind the ticket office, once led to the freight room.

The water tower at Greenbank is not original to the railroad. There were three water towers on the railroad in 1872. They were located at the Wilmington enginehouse, near Yorklyn, and in Landenberg. The Greenbank water tower was built in the mid-1960's by Hall-Woolford Company of Philadelphia for the Wilmington & Western. The tank held nearly 6,000 gallons of water and is constructed of white cedar. To reduce yearly maintenance costs on the wooden tank, a 4,000-gallon free-standing plastic tank was installed inside the wooden tank in the early 1990's.

8 NEW CASTLE COUNTY WORKHOUSE

Located between the railroad tracks and Route 2, on what now is County Park property, was the New Castle County Workhouse. In the early 1800's, when surronding states were begining to implement prison reform, Delaware Governor Richard Bassert appeared before the Delaware General Assembly and urged the state to build a state penitentiary. For the next eighty years the subject was debated occasionally in the legislature but no actions were ever taken. Several governors attempted to get the legislature to act, but both the State Senate and the State House of Representatives could never agree on a program. In 1887, Governor Charles C. Stockley made prision reform one of the major items his administration would address. Governor Stockley emphasized the need for penal reform in Delaware and advocated a state-wide prison system.

At the time, the state used a system of jails as both detention cells and long term prisons. New Castle County in 1892 had 198 prisoners housed in 40 cells located throughout the county. The pillory and the whipping post were often used as part of a prison sentence. In the 1890's Delaware's prison system was very out-dated and was coming under increased criticism. The criticism was not only coming from within the state but from surronding states that had developed penial systems that were very advanced when compared to Delaware's system.

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Through the 1890's increasing numbers of Delawareans wanted the state to construct a workhouse as a state prison, and implement prison reform. Most states, except Delaware, had already implemented a prison reform system that put prisoners to work. One of the main criticisms of the Delaware system at that time was that both first time offenders as well as seasoned criminals were housed together in groups of two to eight prisoners in a cell. Delaware's jail cells were ideal locations for prisoners to sit idle at taxpayer's expense and do nothing but receive a warm shelter and three meals a day. In fact, many criminals used their jail cells as places to plan future criminal acts with the aid of others in the cell or adjoining cells.

Chief Justice Charles B. Lore, on April 4, 1895, appealed to the legislature to build a workhouse and implement state wide prison reform. While the House approved Lore's plan, unfortunately the Senate turned it down. In following years the plan was debated on many occasions and was always defeated by a narrow margin. When prison reform advocates changed their proposal from a state workhouse to a county workhouse, acceptance of the plan occurred. On March 10, 1899 the Senate passed the New Castle County Workhouse Act and one day later the House approved the same Act.

The Workhouse Act created a Board of Trustees and provided a charter from which to operate. After considering several locations around Wilmington, the Board selected the 38 acre Flinn Farm west of Wilmington as the site for the county's new workhouse. The property cost $8,000 and included a small stone quarry. One side of the property was bounded by the Brandywine Springs Trolley Railway and on another by the Baltimore & Ohio Railroad. Located near the Red Clay Creek, the workhouse would be accessible by the Capitol Trail. In March 1900 the Pauly Jail Building Company was contracted to construct the new prison facility. Completed June 1, 1901 at a cost of $175,000, the prison received its first prisoners on November 7, 1901.

Almost from the start the prison was too small to handle an average prisoner population of around 200. To make matters worse nearly one third of the prison's population was serving sentences of thirty days or less. On April 3, 1905 the state legislature passed a bill that allowed Kent and Sussex Counties access to the prison. The New Castle County Workhouse was now effectively a state prison but was operating with a county prison charter. In 1905 and 1906, to meet the need to house additional prisoners from the state's lower two counties, the facility was expanded with the addition of new wings.

As the state's population continued to grow the prision's average population also grew. In 1914 the state purchased or leased over 450 acres on various farms within two miles of the workhouse. One site, owned by the state just north of the main workhouse, became known as Delcastle Farm. In 1918 a bunkhouse to house thirty men was built at Delcastle to relieve overcrowding at the main workhouse. In 1931 the leases on all farms were terminated and Delcastle Farm became an official part of the prison program. In 1929 a women's prison building was constructed at the workhouse site.

By 1931 both Kent and Sussex Counties had constructed their own county prisons to relieve overcrowding at the New Castle County Workhouse. Now, with each of Delaware's counties operating their own prision, the state still did not have a state wide prison system. In 1938 the U.S. Department of Justice, Bureau of Prisons inspected the New Castle County Workhouse and declared it the 11th best city or county jail and workhouse in the country. At that time there were six red brick buildings with slate roofs at the workhouse. The workhouse housed an average of 520 prisoners each night in 320 steel cells that measured 5' by 7' by 8' high. The land now used as parking area for Greenbank Sta-



NEW CASTLE COUNTY WORKHOUSE
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tion was once a vegetable garden worked by the prision inmates. The Delcastle Farms site occupied more than 500 acres and housed 154 inmates in two stone and cement buildings.

In 1955 the Delaware Department of Correction merged five prison facilities into a state wide prision system. These five prisons were the Women's Prision at Greenbank, the New Castle Correctional Institution (formerly the New Castle County Workhouse), Delcastle Farm, the Kent Correctional Institution, and the Sussex Correctional Institution. Delaware finally had a state penial institution even though it was spread out among five sites. On August 2, 1967 Governor Charles L. Terry conducted ground breaking ceremonies four miles north of Smyrna for an 11.5 million dollar state correctional institution. The new Delaware Correctional Center at Georgetown was complete in early 1971 and the state started moving prisoners into the new facility in April 1971.

The New Castle County Workhouse stood empty for several years before it was torn down in the mid-1970's. Today the only remnants of the workhouse are the Woman's Prison building and a lone guard tower. The Woman's Prision building is still in use as a detention facility to house individuals awaiting a court hearing. The land is now home to a County Park and includes several tennis courts. The Delcastle Farm site is now the Delcastle Recreational Center which includes tennis courts, jogging trails, baseball diamonds, and a golf course.



GREENBANK MILL
Artist's rendition of Greenbank Mill which is used as the logo for Greenbank Mill Associates.

9 GREENBANK MILL

The first mill at Greenbank was built by the Swedish in 1677. In 1773 Robert Philips purchased the property from Empson Bird and took over the milling business. After the War of Independence, Philips tore down the old mill and built the present facility in 1782. The mill was automated in 1812 by the installation of automatic flour-mill equipment invented by Oliver Evans of Newport, Delaware. In addition to the milling of flour, Philips started to mill wool at the site. He purchased a small herd of Merino Sheep that produced a very fine wool for manufacturing purposes. In late 1830, Robert's son John C. Philips purchased the mill at public auction after a claim had been entered against his father.

In 1852 William G. and Isaac D. Philips, John C. Philips' sons, purchased the mill from their father. William later built his mansion on a grassy bank overlooking the mill. He named it *Greenbank* and soon the name was adopted as the community's name. Under Isaac's direction the mill turned to manufacturing wooden products such as hubs, spokes, felloes, and general bentware. With Wilmington becoming known as *the queen city for carriages*, there was much demand for wheel parts, and the brothers formed William G. Philips & Brother. They expanded the business to include folding camp chairs, folding stools, step ladders, and croquet mallets. In 1888, after his brother's death, Isaac sold the mill to James and Ellis Clark.

By 1891, after the mill had transferred between the Clarks, the mill was sold to Joseph W. H. Watson of Newport. The mill never returned to the milling of woolen products or the manufacture of wooden articles. With the wheat growing business moving to the fertile lands of the mid-west, and Greenbank Mill not being modernized with modern roller equipment, business dropped off to only a handful of local farmers. The mill had several owners in the early 20th century, all of whom operated the mill to grind local grain.

Historic Red Clay Valley, Incorporated purchased the still operating mill in 1964. In August 1969, a fire set by vandals destroyed most of the mill and its contents. Fire-ravaged beyond recognition, the mill ended 187 years of continual milling operations. Clean-up after the fire and the salvaging of what was left of the mill's contents was the first order of business. A plan was developed to rebuild the mill as a historic Delaware landmark.

An informal group, Friends of the Mill, was formed as part of Historic Red Clay Valley, Incorporated and charged with restoration of the mill building. In July 1973, in recognition of its importance to the Red Clay Valley, the mill was added to the Na-

New Hope Solutions
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tional Register of Historic Places. In 1984 the Friends of the Mill became a semi-autonomous organization with its own budget and officers. In 1988 the group became completely independent and began operation of the mill facility as Greenbank Mill Associates, Incorporated. The group is a non-profit, all volunteer organization whose purpose is to preserve the history and structure of Greenbank Mill. When fully restored the mill will include an operating milling area which will be visible through glass panels from the building's main floor.

Restoration and preservation of the mill by Greenbank Mill Associates, Incorporated continues and the facility is available for rent for social occasions. The mill offers a public meeting room for up to 80 people and ample parking is available in an adjacent lot. A fully equipped caterer's station accommodates serving light refreshments or a full meal. For information regarding the availability of the mill, contact Greenbank Mill Associates at 302/999-9001.

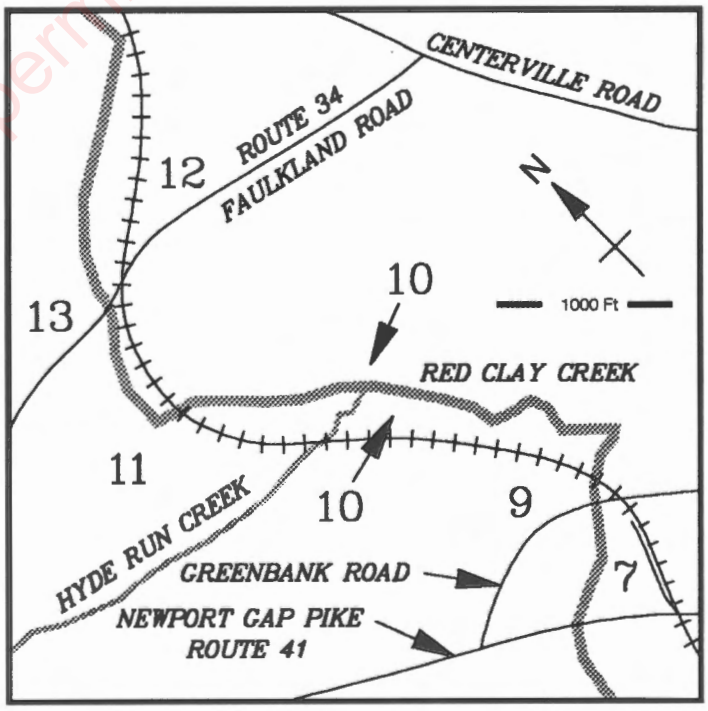
10 KIAMENSI SPRING WATER COMPANY

There are several well-known springs in the hills between Greenbank and Faulkland. One spring, rich in iron, served the Brandywine Chalybeate Spring Company (now the site of Brandywine Springs Park) and was advertized for its medicinal purposes in the early 1800's. A second spring, found free of impurities, was tapped by the Kiamensi Spring Water Company in the early 1900's. The natural springs between Greenbank and Faulkland, as well as ones all along the route of the Wilmington & Western, contribute to the flow of the Red Clay Creek.

The natural spring at Kiamensi was well known by the Kiamensi Indians for whom the area is named. The Indians considered the water flowing from the Kiamensi spring to be a sacred gift direct from the Great Spirit. They made a special effort to keep the area free from contamination. The Kiamensi knew of the spring's purity and believed it had curative qualities. As the Kiamensi Indians were driven from the lands, the lore of the spring was handed down through generations. In the early 1800's people would come from as far as Europe to taste the waters of the spring and test its curative qualities.

In 1907 the Kiamensi Spring Water Company capitalized on the famous spring by building a bottling plant at the top of a knoll east of the Red Clay Creek. At the base of the eighty foot knoll on the bank of the creek where the spring was located, the company built a concrete reservoir around the opening of the spring. The reservoir had an arched roof and was constructed so neither drainage water nor airborne dust could contaminate the spring water. Next to the reservoir that held 15,000 gallons of spring water, a pumping station was constructed. The pumping station contained a two-horsepower gasoline engine that pumped the water through galvanized pipes to a sealed 10,000 gallon wooden storage tank next to the bottling plant.

In the bottling plant, each bottle was prepared for filling using water from the spring. Every bottle was first washed using revolving brushes that cleaned all bottle surfaces. Using specially designed machinery each bottle was inverted and rinsed. The rinsed bottles were then placed in a sterilizing cabinet for ten to fifteen minutes and exposed to steam boiled from the spring water. Once the bottles were sterilized they were filled and sealed. The bottling plant prepared water in 8 ounce, and half, one, two, and five gallon sizes at a daily capacity of 10,000 gallons of bottled spring water.



MAP #3 - GREENBANK to FAULKLAND

The Kiamensi Spring Water Company advertized their water as absolutely pure, and many of their ads included analysis of the contents of their product. Water was shipped to Philadelphia and other loca-

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tions using the People's Railway (a trolley line from Wilmington) and the B&O Railroad. The B&O Railroad shipping dock was located just south of Hyde Run Creek between the railroad track and the Red Clay Creek. To move crates of water from the bottling plant at the top of the hill east of the creek, to the shipping facility on the west bank of the creek, an overhead conveyor system was used. Cases of water were attached to special hangers on a cable system that crossed the creek. Full cases of water would travel west to the railroad shipping building and dock, and empties returned east to the plant at the top of the hill.

In 1914 the Kiamensi Spring Water Company was purchased by the National Table Waters Company of Philadelphia, Pennsylvania. National Table Waters produced aerated waters, root beer, and ginger ale. National kept the Kiamensi name as it had become a well-known brand name. Their plant at Kiamensi operated until about 1925.

Today, little remains of the bottling operation. There are about a dozen concrete piers and many pounds of broken green and brown glass bottles in the area of the railroad shipping building and siding just east of the railroad tracks. The concrete walls of the reservoir building that had been built around the spring, and the concrete foundations of the pump house are still visible alongside the eastern bank of Red Clay Creek. At the top of the hill, above the pump house and reservoir, are the concrete foundations of the bottling plant.

11 BRANDYWINE SPRINGS

A large hotel was constructed at the top of a knoll on the 61 acre property in 1826, one year before the land was sold to the Brandywine Chalybeate Spring Company. The hotel was called the Brandywine Springs Hotel and was a four story building with more than one hundred guest rooms. The facility could accommodate parties and celebrations of nearly 1,000 people. The term *chalybeate*, pronounced *ka-lib-e-at*, means *impregnated with salts of iron*. Guests of the hotel were permitted to drink from the property's chalybeate mineral spring that was advertized for its medicinal purposes.

The hotel lost money, and in 1833 it sold to Matthew Newkirk of Philadelphia. As Director of the United States Bank, Newkirk was one of Philadelphia's wealthiest men having organized the Philadelphia, Wilmington, and Baltimore Railroad Company. By 1836 Newkirk had expanded the facility, and his promotions of the hotel and spring attracted many fashionable and prestigious people of the time including Henry Clay, Daniel Webster, James Buchanan, Jefferson Davis, and John Quincy Adams.

With the country's economic problems of the 1840's, the operation began to loose money. There were several owners of the land between 1855 and 1869, but the hotel saw few customers and fell to general disrepair. The Brandywine Springs property was sold at a sheriff's sale to Franklin Fell in December 1869. A year and a half after Fell purchased the land, the hotel hosted the ground breaking ceremonies for the Wilmington & Western Rail Road on July 8, 1871. When Fell's plans to convert the hotel into an Episcopal Church Boarding School for girls did not materialize, the site was again put up for sale. The property did not sell, but as there was interest in renting, Fell allowed the property to be rented. For over a dozen years the hotel site had various renters and continued a general decline.

In 1886 Richard W. Crook rented the Brandywine Springs property from Franklyn Fell. Believing the site might make a profitable amusement park, Crook started developing an amusement park on the property. He built a restaurant and toboggan slide by 1890 and added a carousal in 1891. After nearly



BRANDYWINE SPRINGS AMUSEMENT PARK ENTRANCE
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FAULKLAND STATION
Faulkland Station was typical of all Wilmington & Western Rail Road stations. While the date this photo was taken is unknown, the box car to the left of the station, parked on the station's siding, has a Baltimore & Ohio Railroad logo in the upper right corner. The road to the right is Faulkland Road. Today, trees cover the area left of the tracks.

15 years of renting, Crook purchased the Brandywine Springs property and formed an amusement company.

In 1903 one of the first moving picture theaters in the state was constructed at Brandywine Springs. By 1907 the park offered fun houses, pony rides, roller skating, a theater, a miniature steam railroad, band shell, 6 acre lake, and even a wooden roller coaster. In addition to being served by the B&O Railroad, Crook and a group of investors built the People's Railway to provide trolley service between the park and Wilmington.

As the automobile gained acceptance, interest in trolley parks declined and in 1923 the amusement park closed. In 1951 the State of Delaware bought the park and in 1956 it became the first State Park in Delaware. In 1970 the park was turned over to New Castle County to become a county park.

The State Mineral, Sillimanite (Al_2SiO_5), occurs in an unusual form along Hyde Run Creek just south of Brandywine Springs. Here large, light-brown boulders composed entirely of fibrous sillimanite have eroded out of the surrounding rocks. Although the mineral has been found in fist-sized chunks at many localities worldwide, masses of boulder-size sillimanite are very rare. Sillimanite is present in many of the rocks in the Delaware Piedmont, but only at Brandywine Springs and Hoopes Reservoir does it form large aggregates. At Hoopes Reservoir near Wooddale, the sillimanite aggregates are fist-size and dark gray-blue in color.

Sillimanite is often called fibrolite because of its fibrous habit or tendency to form in clusters of long slender crystals. The mineral is named after Benjamin Silliman, a famous nineteenth-century American geologist and founder of Silliman's Journal, now the American Journal of Science. Sillimanite is considered an industrial mineral and is sometimes used in the manufacture of refractories and high-temperature crucibles. Some green and blue pearly luster varieties found in Brazil and South Carolina are used in jewelry.

Finding sillimanite in rocks shows the rocks are aluminum-rich and that they have been heated to temperatures greater than six hundred degrees centigrade at pressures of four to six thousand atmospheres. The high temperature and high pressure event that formed the sillimanite at Brandywine Springs is assumed to have occurred during the formation of the Appalachian Mountains, about 400 to 500 million years ago.

12 FAULKLAND STATION

Franklin Fell, owner of Brandywine Springs, provided four and one-quarter acres of land for the railroad right-of-way at a selling price of $150 per acre. The sixty-foot wide right-of-way started at Hyde Run Creek and ran for six-tenths of a mile to the Faulkland Mill dam at the northern boundary of the property. When the railroad needed additional stock subscriptions sold to meet the mini-

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mum number needed to start construction, Fell was contacted to purchase additional subscriptions. He agreed on the condition that a station would be constructed on his property. The railroad did not want to sell subscriptions that had conditions attached, but they agreed to seriously consider his proposal if the land became available and the location fit the needs of the railroad.

The Wilmington & Western's Faulkland Station was located on a triangular piece of land northeast of where the railroad tracks cross Faulkland Road. Franklin Fell provided the land for the railroad station at a selling price of $1. The sales agreement stated the Wilmington & Western had to construct a neat and substantial first class railroad station by the name of *Faulkland*, and that the station had to appear on company maps. The agreement also stipulated that no malt or spirituous liquors would be consumed or sold on the premises, and that all trains had to stop at the station. Faulkland Station was established as a post office by the Postmaster General on November 22, 1872.

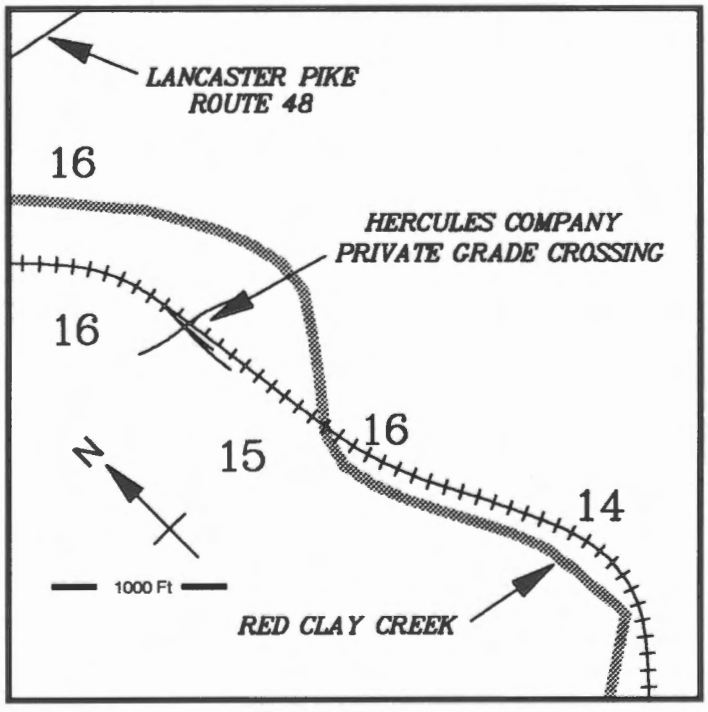
13 FAULKLAND SPICE AND GRIST MILLS

During the latter part of the eighteenth century and during most of the nineteenth century Faulkland, Delaware was probably one of Delaware's better known communities. Faulkland's eminence began to develop with the opening of the Oliver Evans Grist Mill that was operated by Oliver and his two brothers beginning in 1782. It was in this mill, at the age of 32, that Oliver invented and improved his automated milling processes.

The common practice of the time for grinding flour involved a lot of manual labor. The power of the water wheel was used to turn only the mill-stones. Bags of grain, carried by the miller to the upper story of a mill, were dumped down a chute to the mill-stone. The ground flour and bran from the mill-stone fell through another chute to the mill's basement where it was bagged and carried to the attic and spread on the floor to dry and cool. After being turned until it was dry, the flour and bran was dropped through another chute to a boulter that separated the bran from the various grades of flour.

Evans automated the manual labor by using the power of the water wheel to operate various types of conveyors. The conveyors transported the grain and flour within the mill building. His inventions, patented in 1787, included the *hopper boy* and four forms of conveyors; an *elevator* designed as a continuous belt conveyor with buckets; the *screw*, a conveyor resembling a modern vertical screw conveyor; a *decender* that was a bucketless belt conveyor to move material downward; and a *drill*, a screw conveyor operating horizontally. He devised the hopper boy as a device to rake the flour and bran until dry. The result of Evans' inventions was that the miller simply dumped the grain in at one end of his mill and capped the filled barrels of graded flour at the other end. Evans' milling inventions are credited with *revolutionizing the flour milling industry*. Many consider Evans' milling process the *prototype for all automated continuous-production processes used in industry today.*

Shortly after his flour milling patents were granted, Oliver Evans gave Robert Philips permission to use the patented processes at Greenbank. In 1804 Oliver developed the first steam-powered dredge in America. It was a unique amphibious craft capable of moving on wheels over land. The craft was powered by an on-board high-pressure steam engine. Reaching water, a paddle-wheel was attached to the rear making it the first steam-powered paddle-wheel driven boat in history. It is interesting to note that Oliver Evans operated his paddle wheel driven dredge in 1804 on the Delaware River almost three years before Robert Fulton invented the steamboat!



MAP #4 - FAULKLAND to WOODDALE

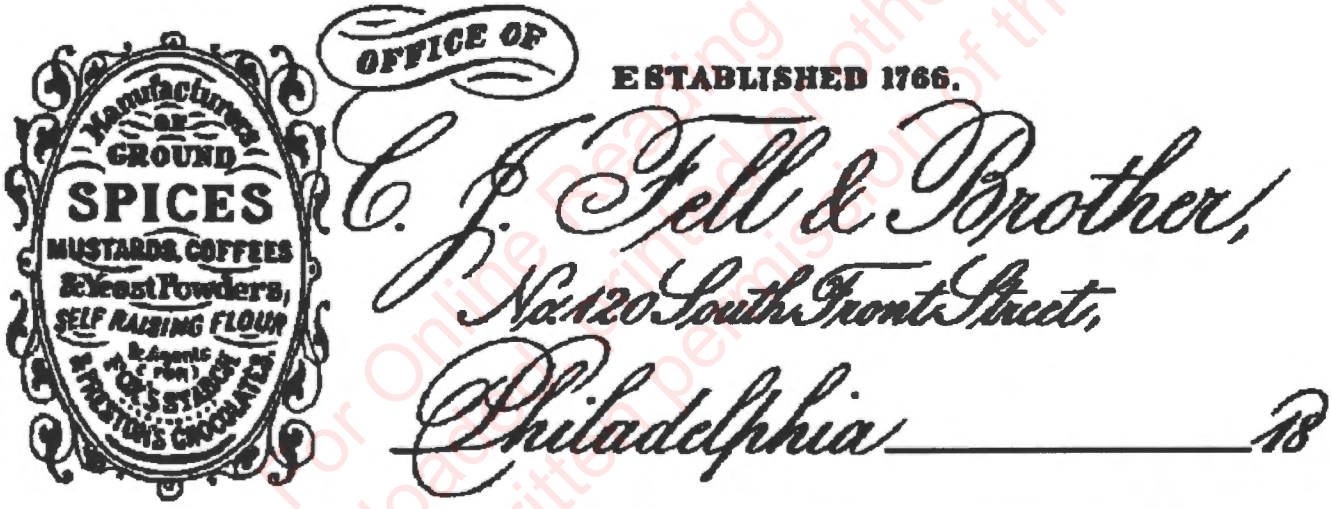
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Fascinated by the steam engine and the potential that it offered, Evans improved the steam engine to make it more reliable and powerful. In 1809 he installed his improved steam engines in mills in Lexington, Kentucky and Pittsburgh, Pennsylvania. These mills were the first mills in the country to be powered solely by steam. He is considered the inventor of the modern high-pressure steam engine. High-pressure steam engines, operating at pressures of 150 pounds per square inch and greater, were incorporated into practically every steam locomotive ever manufactured. In 1812 he suggested to President Madison that a boat capable of submerging under water and returning safely to the surface was possible and could be built.

While railways, railroads, wagonways, tramways, and other rail-mounted forms of transportation were used in both Europe and America in the 1700's and early 1800's, Oliver Evans predicted the development of the steam engine as motive power for railroads. Oliver believed in the power of the steam engine and developed designs to harness its motive power by mounting the engine on a special carriage set up to pull additional carriages of passengers along a set of parallel steel rails. He envisioned trains of carriages routinely moving between cities, and travelers both sleeping and dining in carriages specifically designed for those purposes.

In 1813 he wrote a letter to the **New York Commercial Advertizer** where he described *carriages running on a railway at 15 miles per hour pulled by a steam-powered carriage*. He tried building the first steam-powered railroad by finding financiers to back a railroad that he would construct between Philadelphia and New York. Unfortunately, even after offering a money-back guarantee, he was unable to find any partners for the venture. Oliver died in 1819, never seeing the steam-powered railroad develop. It would take another six years before John Stevens would successfully demonstrate a steam engine's ability to move a carriage on rails in Hoboken, New Jersey.

Evans' mill was sold to William Foulk who operated it between 1798 and 1828. After the property was sold to Jonathan Fell in 1828, the milling of spices began at Faulkland. While it has been difficult to document, it is believed that Jonathan Fell built a second mill solely for the milling of spices while still operating Evans' original grist mill. It is known that the Faulkland mill site became famous for its spices, many of which were brought from around the world to be ground in the Faulkland mill.



1870's LETTERHEAD FOR THE C. J. FELL & BROTHER SPICE BUSINESS

By 1832 the annual production of the mill included 100,000 pounds of cocoa; 800 bushels of mustard seed; 200,000 pounds of ginger; 50,000 pounds of black pepper; 5,000 pounds of cassia; and 1,000 pounds of other spices along with a modest volume of barley.

Over the years the spice milling business was passed on from Jonathan to his two sons. Courtland J. Fell continued expansion of the business and later his younger brother Franklin operated both the mill at Faulkland and the family store and warehouse in Philadelphia. By 1857 the Fells had added a steam driven packaging machine to weigh and pack spices. An 1864 product list included coffee, chocolate, cocoa, ginger, pepper, cassia, allspice, cloves, brown and yellow mustard, rice flour, barley, hominy, cream tartar, baking soda, indigo, split peas, caraway seeds, and mustard seeds.

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On three occasions fires destroyed the spice mill. The first fire occurred in September 1867. A second fire in March 1874 destroyed the rebuilt mill and brought creditors to the doorsteps. After a third fire in 1878, the mill was not rebuilt. The original Evans' grist mill is believed to have operated until 1894.

14 BROOKMEADE II AND BROOKMEADE III

Along the east side of the Wilmington & Western's right-of-way are the housing developments of Brookmeade II and Brookmeade III.

15 HERCULES

The Hercules Powder Company was organized in 1912 after the government ordered the end to the DuPont gunpowder monopoly. The name Hercules was selected as it was a recognized brand name of gunpowder manufactured by an earlier company DuPont had acquired. As the new company grew, the need to create a centralized research facility began to develop. DuPont had provided everything necessary to manufacture explosives, but if Hercules was to grow, they would need to remain competitive from a research and development perspective. Many companies relied on outside sources for research and development and Hercules was beginning to see the need to provide this capability within the organization. Hercules was beginning to understand why DuPont, AT&T, General Electric, Alcoa, and General Motors had dedicated internal resources to a centralized research and development organization.

A group of Hercules' managers was assigned to study the problem and make recommendations. The company already had the beginnings of a research and development organization at their Kenvil, New Jersey site. One question to be answered was whether to enlarge the Kenvil site or to build a new facility near the corporation's headquarters in Wilmington. The team consulted Charles M. A. Stine at DuPont who quickly convinced the group of the many benefits of having the research and development organization under the shadow of the corporation's headquarters. As much as Hercules' management would have liked to move farther from E. I. DuPont's shadow, and away from competing in the same research labor market, a decision was reached to locate in Wilmington.

In 1929 Hercules started full-scale engineering studies for a new research and development facility. The company purchased the 200 acre Alfred D. Peoples farm in the spring of 1929 and an additional adjoining 100 acres of land in the fall of the same year. These parcels of land were especially inviting because Lancaster Pike provided access to Wilmington and the Baltimore & Ohio Railroad would provide freight access. In 1930 Hercules started construction and when the facility was op-



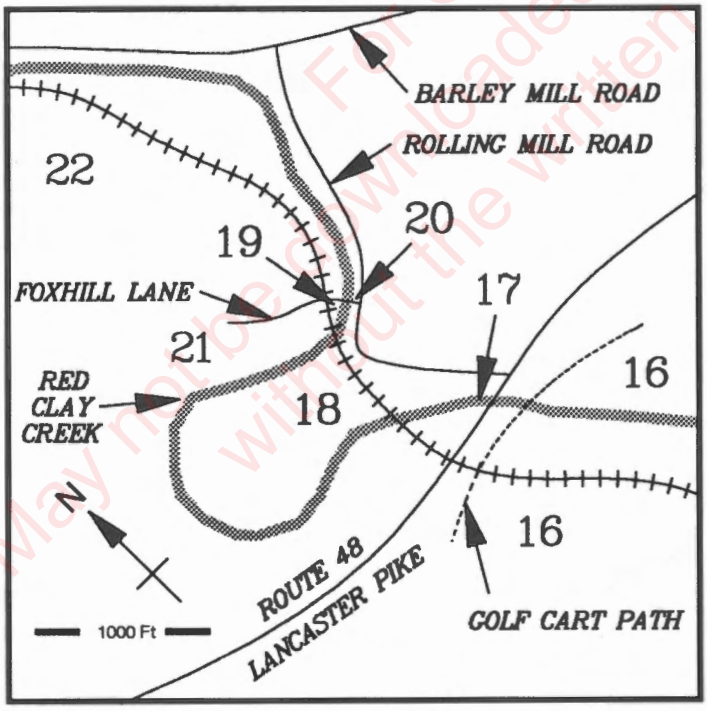
HERCULES GOLF COURSE
This photo, taken in 1941, looks south from the rocky hills at Wooddale. B&O locomotive #2037 crosses Bridge 8A having just crossed Lancaster Pike. Hercules water tower is clearly visible as are the Research Center buildings to the right of the tower. Hercules Golf Course is between the Research Center buildings and Lancaster Pike.

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erational in 1931 it had cost over one million dollars. When Hercules opened the site, the new facility included eleven research and development buildings and laboratories, a powerhouse with a railroad coal delivery trestle, and various state-of-the-art test facilities. Today the facility includes about 70 buildings on nearly 1,000 acres of land.

HERCULES

Hercules, Incorporated is a diversified worldwide producer of chemicals, materials, and solid fuel systems. They manufacture such products as resins for inks and adhesives, chemicals to improve the properties of paper, flavors and natural gums for the food industry, and water-soluble polymers as thickeners and stabilizers in paint. Other products include solid propellant rocket motors, carbon fiber materials and carbon fiber structures, polypropylene fiber for absorbent products and upholstery, and polypropylene film for packaging. Hercules still manufacturers smokeless powders for defense, space exploration, and for sport shooting.



MAP #5 - WOODDALE

16 HERCULES COUNTRY CLUB AND GOLF COURSE

Between Brookmeade and Lancaster Pike the Hercules Golf Course borders the railroad right-of-way. The golf course also borders the railroad right-of-way between the Research Center and Lancaster Pike. About 300' south of Lancaster Pike (Route 48) is a golf cart crossing that may be the only railroad golf cart crossing in the country. In addition to the golf course, the Hercules Country Club offers banquet facilities and meeting rooms that may be booked for individual, private, and corporate functions.

17 U.S. GEOLOGICAL SURVEY WATER RECORDING STATION

The Red Clay Creek watershed, from its mouth on the White Clay Creek near Stanton to its headwaters in Chester County, Pennsylvania, encompass a drainage basin of 54 square miles of Delaware and Pennsylvania. Located upstream from where the Red Clay Creek passes under Route 48, is one of several surface-water stream gages operated by the Water Resources Division of the United States Geological Survey in cooperation with the Delaware Geological Survey. Installed in April 1943, the station at Wooddale was updated in September 1950. Located 4.9 miles from the creek's mouth at Stanton, the Wooddale station monitors Red Clay Creek water flows and levels for a drainage basin covering 47 square miles.

Surface-water stream gages are located throughout Delaware and are used to monitor water levels or stages and associated water discharge. The station at Wooddale provides valuable information on Red Clay Creek watershed activity. Wooddale station data is used to evaluate hydrologic conditions such as floods and droughts. Wooddale recording station statistics are combined with statistics from other stations in the state to insure the design of bridges and culverts is adequate for worst case storm predictions. This station as well as others in the region, are part of a network that provides data to the State and Federal Government for long-range water resources planning and management.

Based on records kept for the gaging station for

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April 1943 through September 1990, the average flow rate of the Red Clay Creek at Wooddale is 64 cubic feet of water per second, or 1.7 million gallons per hour. The station's information includes the height of the creek within its banks. At the station's location, 5.5 feet on the gauge indicates that the creek is at its maximum bank capacity or is at flood stage. The average water height of the Red Clay Creek on the gauge installed at Wooddale is 2.7 feet.

On July 21, 1975 the station recorded an all-time maximum discharge rate for the creek of 135 million gallons per hour. On July 21st when the creek reached this all-time maximum flow rate, the gauge recorded a water height of 10.32 feet or 4.82 feet above bank full stage. The minimum discharge rate was registered on September 4, 1966 when the creek flow dropped to 121 thousand gallons per hour, or 34 gallons per second.

18 WOODDALE CUT

Wooddale is the first location on the Wilmington & Western where a rider can observe the land changing from gently rolling countryside to a more rugged terrain with deep stream valleys. From Greenbank Station to Wooddale the railroad has been traveling on relatively flat land, rising only thirty feet in more than two miles. Reaching Wooddale, the locomotive starts working harder as steeper grades are crossed, and the train passes through the first of two very large rock cuts located on the original Wilmington & Western. The dramatic change in landform, which can be recognized as the train approaches Wooddale, is due to the bedrock geology of the Delaware Piedmont.

Geologists divide the Delaware Piedmont into two major geologic belts, both elongated in a northeast direction. The rocks of the eastern belt, which underlie the gently rolling hills, consist of igneous and metamorphosed igneous rocks called the *Wilmington Complex*. These rocks most likely originated as volcanic rock in the early Paleozoic era about 450 to 500 million years ago. The rocks of the western belt, which underlie the rugged terrain, consist of a series of metamorphic sedimentary rocks called the *Wissahickon Formation*. These sediments of sand, clay, and volcanic ash were deposited in a deep ocean basin that existed between the ancient North American Continent and a string of volcanos east of the ancient continent.

According to the current theory of plate tectonics, the two plates, an eastern plate carrying the string of volcanos and volcanic rock and the western plate carrying the ancient continent and deep ocean basin, collided about 440 million years ago to begin the process that produced the Appalachian mountains. This process continued for some 200 million years as tectonic activity continued to thrust the two plates into each other. As the two plates continued to collide, the Appalachians grew into a vast mountain range of Alpine proportions. During the collision between the plates, the sediments were metamorphosed, crumpled, and folded as the volcanic rocks were thrust westward.



#3 CROSSES WOODDALE TRESTLE - BRIDGE 8B
Built for the Chesapeake & Ohio's Chesapeake Division, #3 was one of 58 Model S-2 locomotives delivered between May 1949 and March 1950. The American Locomotive Company (ALCO), 115 ton, 1,000 horsepower locomotive carried the number 5015. Later the C&O renumbered the engine 9115. In 1963 it was sold to the B&O. In 1985 the B&O sold the engine to Rohm & Haas in Phila., PA where it was numbered RH-6731. Rohm & Haas donated it to HRCV in 1985.

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Today, after several hundred million years of erosion, the contact line between the volcanic rock and the basin sediments runs near the railroad cut at Wooddale. While the walls of the cut have darkened since the rock cut was blasted in 1871, chipping to expose a fresh surface shows the rocks are the light-colored igneous rocks of the Wilmington Complex. Immediately west of the cut are garnet-bearing metamorphosed sedimentary rocks (gneisses) of the Wissahickon Formation. The postulated fault system that connects the two belts is not exposed, a phenomenon common in the Piedmont, where the lack of exposure has frustrated geologists for years.

Iron rings can be found bored into the rock walls of the cut. This cut was dug without the aid of power equipment using manual labor and oxen. The rings were used to attach ropes and pulleys to aid in removal of the large boulders as they were blasted free with dynamite.

19 WOODDALE STATION

Wooddale in the 1890's presented a far different appearance than it does today. The village had a population of one-hundred and was served by a railroad. There was a major turnpike nearby, a post office at the train station (established November 27, 1872), and there was a church, school, general store, and hotel in the area. Today all that remains at Wooddale are remnants of the mill race and some mill site buildings that have been converted into homes.

The original Wilmington & Western Wooddale Station was located between the railroad tracks and the Red Clay Creek southwest of what is now Foxhill Lane. When stock subscriptions were being sold for the new railroad, Alan Wood was approached to buy $5,000 worth of subscriptions in addition to those he already owned. He agreed provided the railroad built a station in the vicinity of his rolling mills. While the railroad would not accept stock subscriptions that were conditional, they did agree to consider locating a station near his property. Once sufficient stock subscriptions had been sold and track construction had started, railroad officials approached Alan with a proposal to purchase land for a station. Alan agreed and he and his wife Ann sold the Wilmington & Western Rail Road the necessary land for a sum of $5.00.



WOODDALE STATION
Wooddale station was located southwest of the covered bridge between the railroad tracks and the Red Clay Creek. The buildings in the foreground are part of the iron rolling mills.

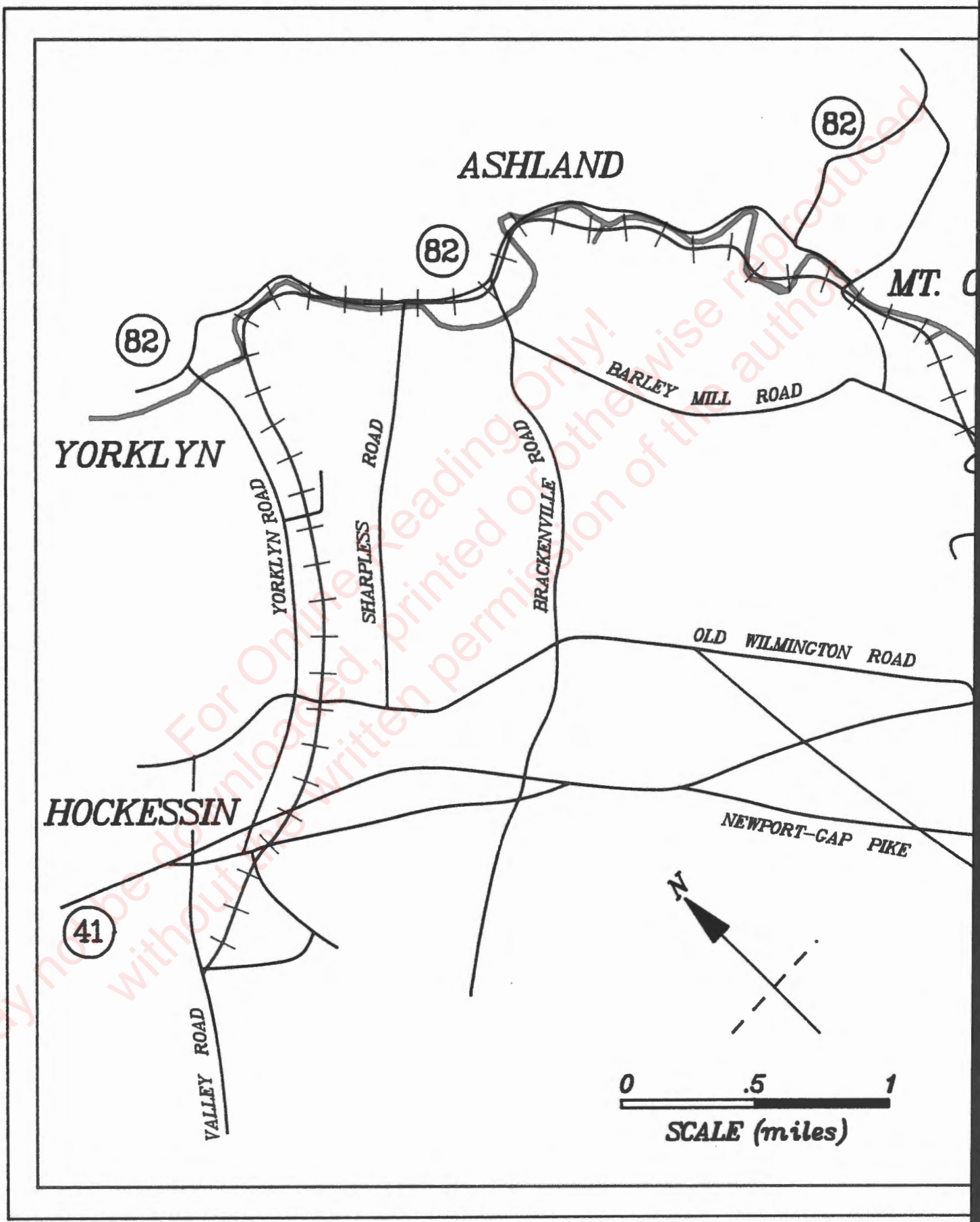
The railroad proposed the name *Alandale* to Alan and his wife as the name for the new station. After some consideration Alan rejected the name and suggested the railroad consider *Wooddale* as the station's name. Wooddale was the name given to the Wood's family mansion that had been built on a hill that overlooked the mills. When the railroad built the station they named it Wooddale Station. The community later adopted Wooddale as the community's name after the railroad station became a United States Post Office location in 1872.

Old county maps show Rolling Mill Road starting from Lancaster Pike and crossing the creek at the covered bridge and continuing into the mill area. A county road project rerouted Rolling Mill Road along the east bank of the creek and connected it to Barley Mill Road. The original road's name starting at the covered bridge was changed to Foxhill Lane.

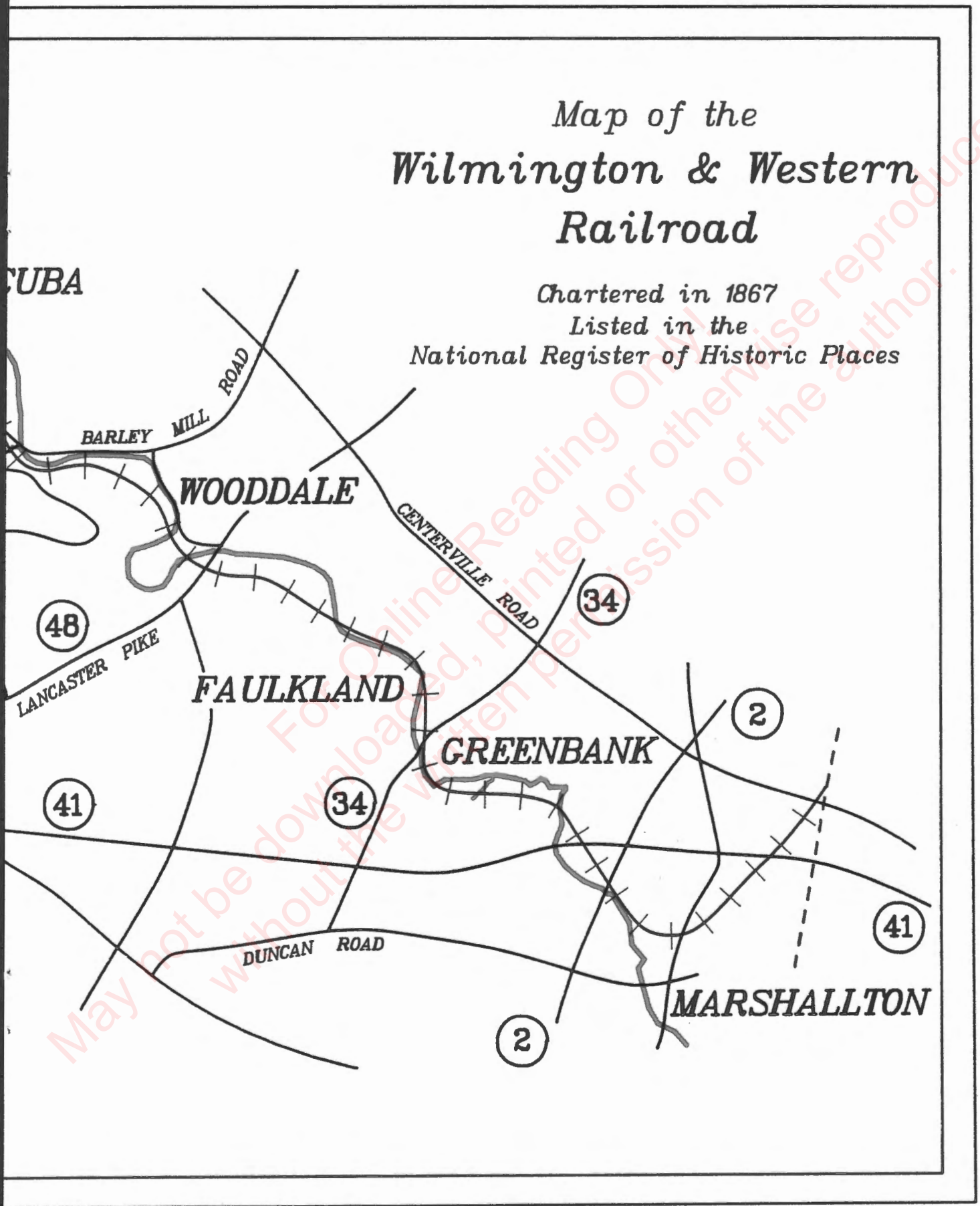
20 WOODDALE COVERED BRIDGE

The covered bridge at Wooddale is one of only two covered bridges remaining in Delaware. This bridge was built about 1870 when the Levy Court of New Castle County authorized the building of covered bridges over the fast streams in the northern part of the county. Delaware never had many covered bridges. Records show that the number of covered bridges in the state approached three dozen. It was the efforts of HRCV in 1965 that saved the Wooddale Covered Bridge after a fire nearly destroyed it.

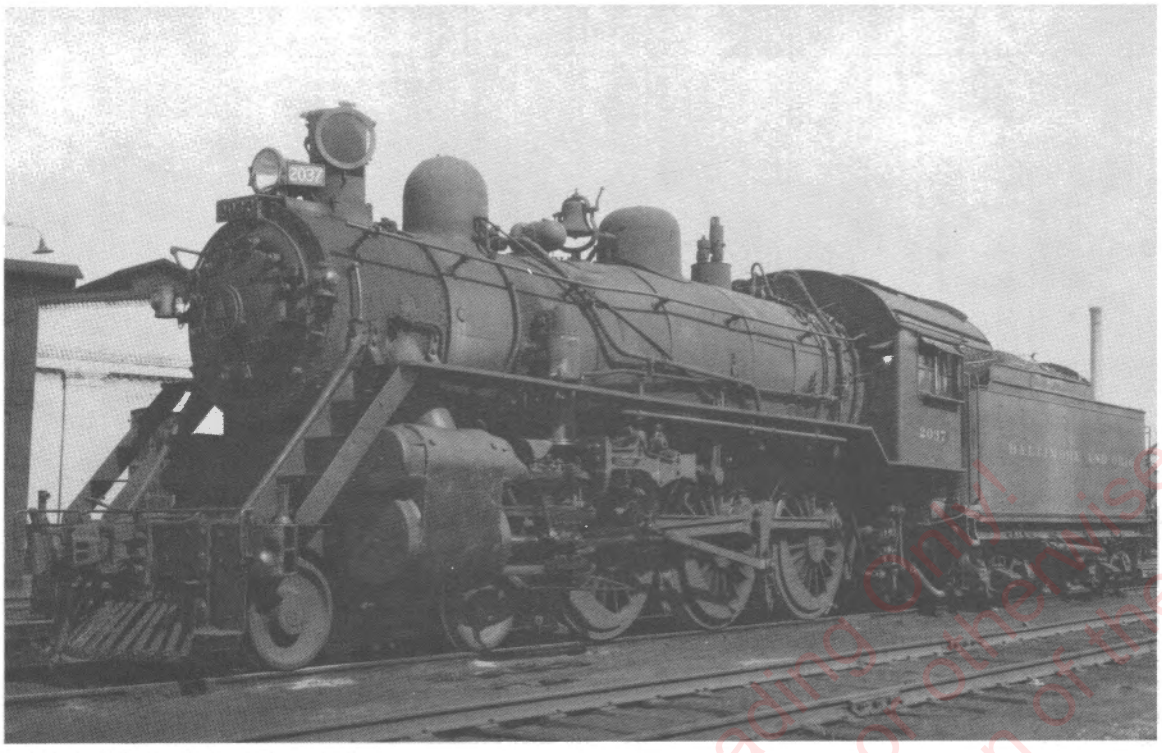
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B&O LOCOMOTIVE #2037
Built in 1901 by Baldwin, #2037 was one of 35 Class B-19 locomotives built as Vauclain compounds. The ten-wheelers had 15.5"x28" & 26"x28" compound cylinders, slide valves, 68" drivers, operated at 200 pounds steam pressure, delivered 27,105 pounds of tractive power, and weighed 177,460 pounds. They carried numbers between 2035 and 2069. The B&O found the design not satisfactory and in 1908 they were converted to Class B-19a simple engines. The conversion fitted them with 21"x28" cylinders, a new weight of 177,000 pounds, and able to deliver 30,870 pounds of tractive power. Starting in 1926, #2037 along with 8 others were converted to Class B-18e. This conversion upgraded them with piston valves and Baker Valve Gear. Locomotives #2037 and #2061 eventually ended up working the Landenberg Branch. In 1953 they were the only two Class B-18e locomotives remaining on the B&O's active locomotive roster.

All of Delaware's covered bridges were constructed in New Castle County as the creeks and streams of Kent and Sussex Counties are small in both size and number. In Delaware's lower two counties, wooden stringer bridges could span most small streams quite well. For the larger creeks either a pile or a trestle bridge was constructed.

The design of a covered bridge is based on the use of wood trusses. The Wooddale Covered Bridge uses a truss design known as a *Town Truss*. The Town Truss was invented in 1820 by Ithiel Town. Town Truss bridges are characterized by their cross-hatched wooden sides that have wooden pins located at each joint. Ithiel's design was later revised and Town Truss bridges are known for their rigidity and being able to support very large loads for the size of the bridge. Inexpensive and simple to build, this truss design was used on spans reaching up to 200 feet in length. The Wooddale bridge spans 60 feet as it crosses the Red Clay Creek.

There are often misconceptions why a bridge was covered. Some suggest that they were covered to benefit water-shy horses, to serve as early billboards, to provide refuge during a quick spring shower, to keep the snow off, and to protect the wooden bridge deck from deterioration due to the weather. The real reason for covering the bridge is related to the design of these bridges.

At each joint in a bridge's truss, the wooden truss members are joined using wooden trunnels (tree nails). In later bridges, the trunnels were replaced with iron bolts. If these joints are exposed to the weather, water may enter the joint. The water not only causes the wood to swell and later shrink as it dries out, in winter the freezing water can actually split the wood. The truss joints become weak under load and work loose due to the vibration of passing loads. In about ten to fifteen years depending on weather, load, length of the span, type of truss design, and the lumber used, an uncovered bridge would fail.

By covering the sides and tops of a wooden bridge, water is kept from the joints and the life of the bridge greatly extended. Even chemical preservation of the wood with materials such as creosote does not extend the life of a wooden bridge unless it is covered. There are wooden bridges that were constructed in the mid-1800's that survive today to carry modern traffic, because they were covered.

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21 DELAWARE ROLLING MILLS

Located between the railroad tracks and the Red Clay Creek is the empty mill race that once supplied water to the mills at Wooddale. Near the covered bridge where the millrace runs under the railroad track, is the spillway gate that controlled the water flow to the mill's water wheels. Between 1812 and 1814 Edward Gilpin and John Smith constructed the first iron rolling and slitting mills in Delaware. The site that Gilpin and Smith choose was near a hair-pin curve on the Red Clay Creek just north of the recently constructed Lancaster Pike. Primary products of the early mills, known as the Delaware Rolling Mills, were iron wheels, barrel hoopes, and wire rod for making nails.

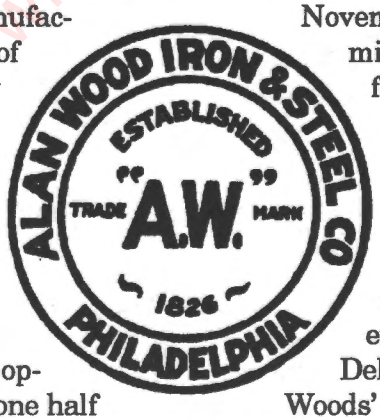
Concurrent with the early development of the Delaware Rolling Mills, James Wood was operating several iron mills in the Philadelphia area. In 1818 James bought the now famous Valley Forge with three other partners. Products of the mill were sickles, scythes, shovels, and other agricultural implements along with files, and cross-cut and circular saw blades. At Valley Forge, James was the first iron mill operator successful in producing crucible steel in this country. James Wood developed an improved process that he patented on February 10, 1825 for the manufacture of steel shovels. Wood's patent was signed by James Monroe, President; John Quincy Adams, Secretary of State; and William Wirt, Attorney General. Until this time, shovel manufacturing processes produced shovels made of iron that were inferior to the Wood's new steel shovel. The Wood's shovel design included a blade held onto the handle with steel straps that were riveted to the blade and the handle.

In 1826 Gilpin and Smith leased the Delaware Rolling Mills to a Mr. Jones. A short time later Mr. Jones hired Alan Wood, James Wood's son, to manage the operation. Knowing that the thirteen and one half mile long Chesapeake & Delaware Canal was about to be built, Alan contracted to supply the 2,500 man work force with his improved steel shovels. In a short period of time both James and Alan took over the lease on the Delaware Rolling Mills. The lease was arranged on July 27, 1826 through the Bank of Wilmington and Brandywine for $500 per year.

Needing to be near the milling operation, both Alan and his wife moved to the mill site. The mill would need repair if it was to make the quantity of shovels needed for canal construction and produce other products as well. By September 1, 1826 the necessary renovations were complete and the manufacture of steel shovels and sheet iron began at the mill. While leasing the Delaware Rolling Mills, Alan patented a method that produced iron sheets that were larger and more uniform in both thickness and smoothness than sheets being produced by other mill operators. Alan's patent was for the process used to manufacture the rollers used to roll the iron into sheets.

In 1831 when Gilpin and Smith decided to sell the mill, it was purchased by J. & J. Whitaker. When Alan's lease expired in 1832 he left the Delaware Rolling Mills for a new mill in Conshohocken, Pennsylvania. The Delaware Rolling Mills' production for the last year that the Woods leased the facility was 40 tons of sheet iron, 110 tons of rolled steel, 750 dozen steel shovels and spades, and 150 dozen steel hoes. After the Woods left, the Whitakers sold the mill to Dr. William Gibbon.

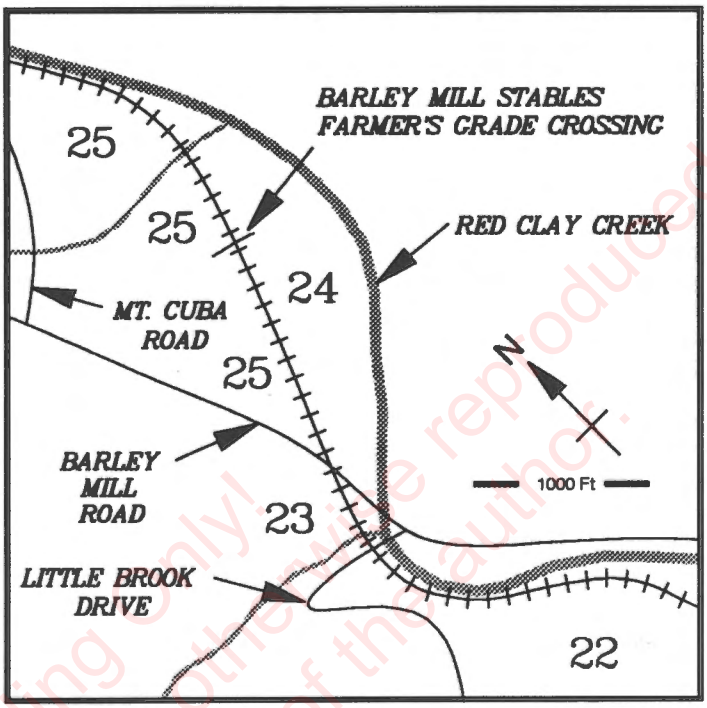
The Woods' Conshohocken operation became unstable as the 20 children of James Wood all spent time operating the mills in various management positions. John, one of Alan's brothers, decided to return to the Delaware Rolling Mills in 1840 and lease the facility from William Gibbon. However, in 1843 when the family needed John back in Conshohocken to operate the mills there, Alan returned to Delaware. Alan purchased the mill from Dr. Gibbon in November 1843 for the sum of $8,000 for the mill and property and an additional $1,050 for the tools and machinery. With purchase of the Delaware Rolling Mills, Alan also ended all business relations with his family and their milling operations in Conshohocken. When Alan took over ownership of the mill and the seventy-five acres of surrounding property, he named the new company the Delaware Iron Works. Installing the Woods' patented iron rollers, he began operating the mill at a capacity of one ton of steel per day.



Alan Wood was an inventor, experimenter, and entrepreneur and made the Delaware Iron Works highly profitable. He continued improving the family's patented process for manufacturing steel shovels. Alan Wood also duplicated a closely guarded Russian process for manufacturing an iron that did

not rust. This iron, known as imitation Russia sheet iron, was a high-quality, finely rolled sheet iron with a deep, glossy, blue-black luster. The Wood family held several patents on the process to make Russia sheet iron, and Alan devoted a large portion of the Delaware Iron Works' production capacity to making this unique sheet iron. The Wooddale mills are not only historically significant because of the production of steel shovels and imitation Russia sheet iron, the mills at Wooddale were the first in this country to roll sheet zinc as well as limited amounts of tin plate.

In the 1860's Alan Wood returned to Conshohocken to open additional mills near his family's mills. Here he formed the Alan Wood Steel Company. When the Alan Wood Steel Company ceased operation of the Wooddale Mill in 1889, it was sold for $8,500. In a short time the mill was purchased by Israel and T. Elwood Marshall. The Marshall brothers converted the mill into a paper mill and began operating this mill along with the old Garrett paper mill in Yorklyn that they had bought in 1889. When the Wooddale mill burned in 1918 it was not rebuilt.



MAP #6 - SPRING VALLEY

22 WOODDALE QUARRY

In the early twentieth century Wooddale Quarry (occasionally called Leach Quarry) supplied ballast stone for the B&O Railroad system. Long trains of hopper cars were brought to the quarry full of ashes and slag from steam locomotives operating on the B&O main line running between Washington, Baltimore, and Philadelphia. As the loaded hopper cars neared the quarry they were dumped along the former Wilmington & Western tracks where the slag and ashes served as ballast and fill. Once empty, the cars were filled at the quarry and returned to the B&O main line to deliver their clean load of ballast stone.

Next to the railroad tracks a small community was built to provide housing for the quarry workers. Some stone retaining walls still stand within several feet of the tracks. Italian immigrants made up almost the entire labor force. Instead of drinking wine, they consumed beer that was made at the Hartman Brewery located across the creek from the quarry. This brewery produced a dark lager beer that was sold in local pubs in the area.

The quarry was last used in 1932 when it supplied stone for the building of Hoopes Reservoir Dam. Hoopes Reservoir was constructed between 1930 and 1932 as a reservoir for the City of Wilmington. While the reservoir receives some water from the Red Clay Creek Watershed, it is primarily filled from water pumped from the Brandywine River. After completing the reservoir fears developed around concerns that continued blasting near the dam might eventually damage the dam's foundations. The quarry was closed shortly after the dam was placed in service. Today, the quarry's upper perimeter provides a breathtaking view for several homes in the development of Spring Valley. A few homes have also been built inside the quarry.

The piedmont rocks exposed in Wooddale Quarry are a complex layering of igneous granites and metamorphic gneisses (gneisses is pronounced 'nice-es'). Wooddale Quarry is located within the Wissahickon Formation, a belt of metamorphic sedimentary rocks that make up part of the Delaware Piedmont. The minerals in the rocks include garnet, sillimanite, biotite, and feldspar, and indicate that they were metamorphosed under very high temperatures and pressures.

The light to dark vertically layered rocks exposed on the back wall of Wooddale Quarry have been of interest to geologists for many years. The light layers are granites composed of quartz and feldspar, and the dark layers are gneisses composed mainly of garnet, sillimanite, and mica. In the 1950's and 1960's when the *theory of granitization* was in vogue, this

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quarry was a popular site. Many well-known geologists from around the world visited the quarry to observe the effects of granitization. According to this theory, fluids originating from deep underground, passed through deeply buried rocks and changed them into granites. Today the *granite controversy* has been resolved and most geologists recognize that granitic rocks formed by melting (igneous processes) rather than by fluids emanating from the deep.

The large scale folding that can be seen on the 175 foot high back wall of the quarry is probably a result of the buckling of the earth's crust during the formation of the Appalachian Mountains. Smaller and sharper folds may be seen at the Mt. Cuba picnic grove where rocks which are part of this formation are also exposed .

23 SPRING VALLEY

This area of New Castle County is known as Spring Valley, Delaware. Spring Valley was named many years ago for the many springs that can be found in this area. A B&O depot located at Spring Valley was known as Wooddale Quarry Station. The station was located between the railroad tracks and the creek just south of the Spring Valley Road grade crossing.

New Castle County has many spring houses still preserved for future generations. A typical example of a preserved spring house is located a short distance from the farm house and barn at the top of the knoll. At the foot of the knoll you will notice a small stone building partially buried in the ground. This building is called a spring house. Before there was mechanical refrigeration, perishable goods were stored in spring houses in watertight crocks. The crocks were placed in the cool spring water passing through the spring house to keep the perishable contents cool.

24 BARLEY MILL TANGENT

The track that crosses Barley Mill Road is part of the second longest length of tangent track on the remaining right-of-way of the Wilmington & Western Railroad. This length of track is straight, or tangent in railroad terms, for nearly four-tenths of a mile. The difference in length between the straight track at Barley Mill and the track climbing Hockessin Hill, which is the longest tangent track on the line, is only 61 feet with Hockessin Hill measuring 2,087 feet in length. The shortest straight length of track is 12.4 feet in length. It is located in the middle of Bridge 12B, the 'S' trestle, between the two curves that make up most of the trestle.

Barley Mill Tangent is the most nearly level section of track on the line between Marshallton and Hockessin. The track rises a little over a foot along the four-tenths of a mile length. Hockessin Hill is the railroad's steepest section of railroad track. The rail-

CAR #4662 - THE PAUL REVERE
Built in April 1929 by the Pullman and Standard Car Company of Chicago, Car 4662 served the Pennsylvania Railroad until 1959. Its original six-cylinder Winton gasoline engines were replaced with Cummins diesel engines during the winter of 1942/43. This changed the car's classification from GEG-350 to OEG-350. The car attracted the attention of HRCV volunteers in 1967 as a derelict on the Green Springs Branch of the Pennsylvania Railroad's Northern Central Line near Lake Roland, Maryland. With help from the PRR and B&O, the car was moved to Marshallton. By March 1980 an entensive restoration project was completed and #4662 entered charter service on the Wilmington & Western. In 1989 a donation by the Revere Copper and Brass Foundation permitted a second restoration project to occur. This restoration involved the replacement of the diesel engines, painting inside and outside, and new seat cushions and coverings. #4662 was named *THE PAUL REVERE* and is used for charters between Greenbank, Mt. Cuba, Yorklyn, and Hockessin.



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road grade climbs Hockessin Hill at an average incline of eighteen inches per every one hundred feet of length.

While our trains move along both of these tangent lengths of track, passengers often lean into the aisles and look forward through the coaches to see the locomotive pulling the train. When looking to the rear, passengers will see the red caboose at the rear of the train.

To follow the Red Clay Creek and serve the many mills, it was necessary for the original Wilmington & Western surveyors to include many curves along the line. Of the 10.2 miles of track that remain today, only 4.2 miles of it is straight or tangent track. The remaining 6 miles are composed of right-hand and left-hand curved track that has radii ranging from 5,730 feet (1 degree of railroad curvature) to 613 feet (9.30 degrees of railroad curvature). A rider traveling between Greenbank Station and Mt. Cuba effectively travels the circumference of a circle two and one half times. Between Greenbank and Hockessin the route of the Wilmington & Western takes a rider four times around the circumference of a circle.

The straight length of track at Barley Mill includes the only farmer's grade crossing now on the line. This grade crossing is a dirt and wood plank crossing. It provides a means for farm equipment to cross from fields on one side of the track to the fields on the opposite side of the track.

25 BARLEY MILL STABLES

Along both sides of the track are fields belonging to Barley Mill Stables. About two dozen riding and show horses can be boarded at the stables. The stables not only have facilities for boarding and riding, there is also an area available for preparing show horses for competition.

Many wild animals native to the Red Clay Valley live in the fields and brush along the railroad right-of-way. The fields are often occupied by Canada Geese making their way north in the spring or south in the fall. Keen observers also may be fortunate enough to spot squirrel, pheasant, deer, and even fox in this area on some trips. The banks of the Red Clay Creek are home to gophers and ground hogs.

26 MT. CUBA & MT. CUBA STATION

In 1730 a wealthy Irish gentleman named Cornelius Hollehan emigrated to Delaware and named his homestead *Cuba Rock*. He was the first Catholic known to live in Delaware and after establishing his home he often entertained Catholic clergy there. The first public Catholic services in Delaware are believed to have



TRAINS TO HISTORY
Each year thousands of grade-school and summer camp children participate in the Wilmington & Western Railroad's *Trains To History* charters. Bus and car-loads of children arrive at Greenbank Station for a trip along the Red Clay Creek. While riding they learn about railroading and some history of the Red Clay Valley. *Trains To History* operate from early May through late October.

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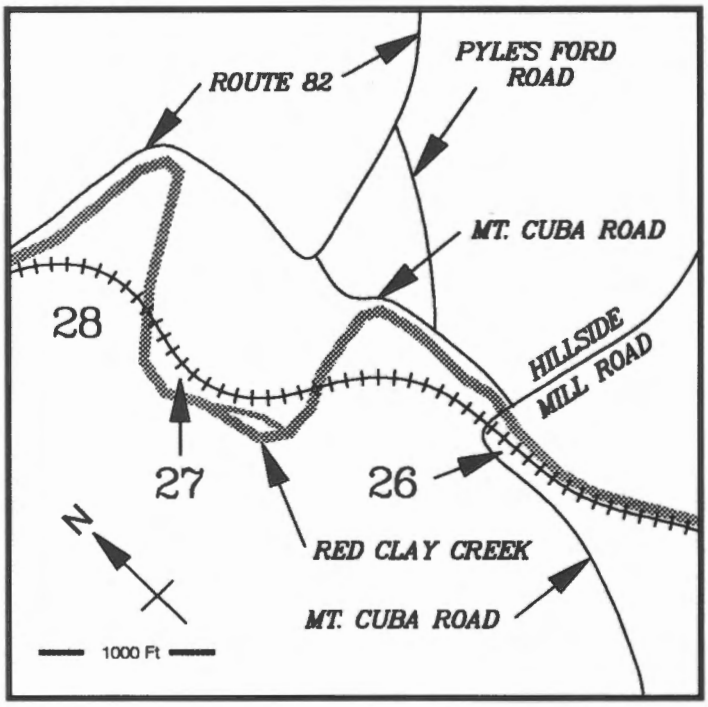
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MAP #7 - Mt. CUBA

been conducted on his estate. Later he purchased *The Old Homestead* which became a meeting place for Catholic services. Mr. Hollehan played a major role in establishing Catholic services in Delaware and he was active in the formation of several local Catholic churches.

Over time the region became known as *Cuba Hill* and eventually *Mt. Cuba*. Today, people often incorrectly refer to Mt. Cuba as Delaware's only mountain. While it originally was the name of a town, Mt. Cuba now refers to an area of both Christiana Hundred and Mill Creek Hundred. Land east of the Red Clay Creek is in Christiana Hundred and land to the west of the creek is in Mill Creek Hundred. The Mt. Cuba tract includes two hills that peak about 350 feet above sea level. Both hills are located on the west side of the creek across from the picnic grove area. Actually the highest point in Delaware peaks at 450 feet above sea level near the northern border of the state a short distance from Ebright Road.

Mt. Cuba was the legendary headquarters of the infamous Sandy Flash, a highwayman who plagued travelers in southeastern Pennsylvania in the late 18th century. His real name was Captain James Fitzgerald, and he had deserted the British Army during the Battle of the Brandywine. Sandy Flash was immortalized as a colonial Robin Hood in Bayard Taylor's **Story of Kennett**.

Located between the railroad tracks and Mt. Cuba Road where the road runs parallel to the tracks was Mt. Cuba Station. Toward the end of the 19th century Mt. Cuba was a busy town of 200 residents. In addition to the station there was a church, school, hotel, saw mill, machine shop, and several stores and flour mills.

Mt. Cuba is the location of Delaware's largest and only professionally supported astronomical observatory. Mt. Cuba Astronomical Observatory is located about one mile east of the railroad tracks on Hillside Mill Road at the top of a small knoll. The observatory's 24" Cassegrain telescope is used by the Department of Physics and Astronomy at the University of Delaware for various research programs. Groups of amateur astronomers use the observatory facilities to support international astronomical programs studying the comets and minor planets. The Delaware Astronomical Society maintains a 12.5" Newtonian telescope on the Observatory's property. The observatory is open to the public for lectures, planetarium use, and star gazing on selected Monday nights by prior reservation. The observatory offers various programs for grade-school students throughout the year. The Observatory's phone number is 302/654-6407.

27 MT. CUBA PICNIC GROVE

The picnic grove at Mt. Cuba was extensive between 1870 and 1895. A railroad station, dance pavilion, band stand, various concession stands, and a small chapel were built here. In the 1870's the Wilmington & Western Rail Road used the picnic grove for special functions including fund raising events. The original Wilmington & Western Rail Road in cooperation with the Philadelphia, Wilmington, & Baltimore Railroad offered special excursion trains from Philadelphia to the grove on Sundays for religious services. Later the Baltimore & Ohio Railroad continued the special excursion trips using their own lines and equipment. The well-known local poet and author, Bayard Taylor of Kennett Square was honored here in October 1874.

In 1968 Historic Red Clay Valley, Incorporated rebuilt the dam located at Mt. Cuba after a storm washed it out. The dam diverted water for several mills located to the east of the railroad tracks. One of the mills was a wooden saw and cider mill that is long gone. This mill could produce 30,000 gallons of cider in one season. The remains of the second mill, a four story stone flour mill, is visible during the winter months when not covered by vegetation.

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Mt. CUBA PICNIC GROVE Wilmington & Western trains started operating to the Mt. Cuba Picnic Grove in 1966 and the location has always been popular. Passengers often bring a picnic with them on the train and stay at the grove to enjoy the relaxing atmosphere and quiet surroundings.

Both mills were unique in that they were powered by horizontal turbine water wheels rather than the more common vertically mounted turbine water wheel. The turbine wheels were mounted horizontally under the surface of the stream. Both mills were closed in 1935 when competition from larger businesses made continued operation of the mills unprofitable. Part of the old mill race that served the Mt. Cuba mills remains intact at the lower part of the picnic grove.

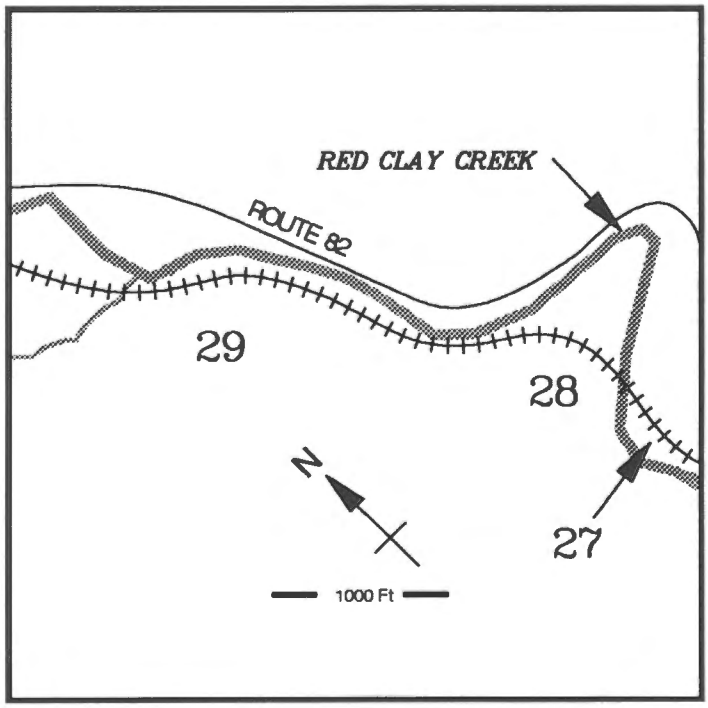
28 MT. CUBA ROCK CUT

The rocks of the Mt. Cuba rock cut are mostly massive, dark amphibolite gneisses. Most amphibolites originate as ash flows or basalt flows from a volcano. The presence of massive amphibolites, interlayered with metamorphosed sediments, suggests that the rock at Mt. Cuba cut formed in a marine basin close to a volcanic area.

Although this rock cut is smaller than the one at Wooddale, railroad history shows the Mt. Cuba cut was more difficult to blast open. The rocks at Mt. Cuba and Wooddale are the same age, are similar in hardness, and have been subjected to the same tectonic forces. It is tempting to hypothesize that the rocks at Wooddale were easier to blast because they were weakened by movement on the large fault system that is present near the Wooddale rock cut.

29 DUPONT ESTATE

The Wilmington & Western Railroad crosses a corner of the Henry B. DuPont estate. The asphalt driveway for the estate, bordered with stone and oak trees, is one of the more scenic grade crossings on the railroad.



MAP #8 - Mt. CUBA to ASHLAND

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30 IRON TRUSS BRIDGE

This is the only iron truss bridge on the Wilmington & Western. It is a secondhand bridge that was moved here in 1907. The Baltimore & Ohio Railroad's bridge records for the Landenberg Branch indicate that this bridge was originally one of the spans of Bridge #124 from the B&O's Wheeling Division. The bridge spans 104 feet, is almost 18 feet wide, and is almost 22 feet high. Built of iron and identified as Bridge 11A on the Landenberg Branch, it is of a construction and design that is known as a *Pratt Truss Bridge*.

31 ASHLAND COVERED BRIDGE

There were about three dozen covered bridges in New Castle County, and Ashland had the distinction of being home to three of them. The longest of the three Ashland bridges washed out during a flood in 1938. This bridge stood next to the railroad's steel bridge where the concrete bridge now spans the Red Clay Creek. The second bridge in the area crossed the Red Clay Creek about one quarter of a mile east of the present concrete bridge. This bridge was not fully covered and it collapsed in August 1967. The only remaining Ashland Bridge, often called the *short bridge*, is on Brackenville Road. Built in the 1870's and spanning 52 feet, this bridge is listed on the National Register of Historic Places and is of a design and construction known as a Town Truss Bridge.



#2037 MOVES FREIGHT ACROSS THE ASHLAND IRON BRIDGE Before the B&O removed the tracks west of Southwood in 1942, it was possible to turn a locomotive at the enginehouse turntable in Landenberg. Without turntable access, consists along the Landenberg Branch took on some interesting configurations to get access to the various sidings .

The Pratt Truss Bridge was introduced by Thomas Pratt and his father, Caleb Pratt, in 1844. Thomas Pratt was a Civil Engineer and worked for various New England railroads, and for a short time the United States Government. The Pratt Truss is a variation of another truss bridge, the Howe Truss. Both truss bridge designs found extensive use on many railroads. In its original form, the Pratt Truss combined the use of timber and metal, wood being used for the vertical web members. However, few structures of this character were actually built, and after 1850 mostly metal structures were built. The connections of the bridge members at the panel points were usually made with metal pins. Bridges of the Pratt Truss design were almost exclusively used on the Baltimore & Ohio Railroad for spans ranging in length from 100 to 200 feet.

32 ASHLAND STATION

A station for the original Wilmington & Western Rail Road was at Ashland and was constructed near the flour mill buildings. It was of typical flat roof construction and included a freight siding. The post office at Ashland was not located at the railroad station but was located in the Sharpless Mills nearby.

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It is interesting to examine the origin of the name for each of the original Wilmington & Western stations to see how each was derived. Wilmington and Landenberg Stations were obviously named for the towns the railroad connected. Kiamensi (Marshallton), Greenbank, Mt. Cuba, Ashland, and Broad Run Stations were named after the communities they served and were placed to maximize passenger and freight revenues. Both Faulkland and Wooddale Stations were named by individuals that financially backed the railroad and their locations were determined by land that was made available at little cost. Yorklyn Station's location was probably influenced by William E. Garrett owner of the Garrett Snuff Mills and a railroad Director. Selection of the name Yorklyn instead of Auburn was made by the railroad Directors for undisclosed reasons. Southwood Station was located near several limestone and kaolin quarries and why the Directors chose it is unknown.

33 ASHLAND MILLS

Stenning Manor, a territory that included portions of northern Delaware and southeastern Pennsylvania, was granted to William Penn by King Charles II. During the mid-1600's, 30,000 acres of this territory was divided. Half was granted to Penn's daughter Letitia and the remaining half was granted to his son William, Jr. The parcel belonging to Letitia encompassed what is now New Garden Township, Pennsylvania and Mill Creek Hundred, Delaware. Letitia's parcel, known as Letitia Manor, was divided and sold beginning in 1702. The first parcel sold was 200 acres in size and was sold to John Gregg. Shortly after purchase of the land, which included a portion of the Red Clay Creek, John erected a grist mill.

By 1715 the mill was producing flour in addition to other products. In 1730 John's son William became the owner of his father's property at Ashland. Seven years later, in 1737, William built a brick home overlooking the mill on the creek. The brick farmhouse, built at the top of the knoll off to the north of the railroad tracks, is often called the *Gregg House*. Built of bricks shipped from England, it one of the oldest structures in the Red Clay Valley.

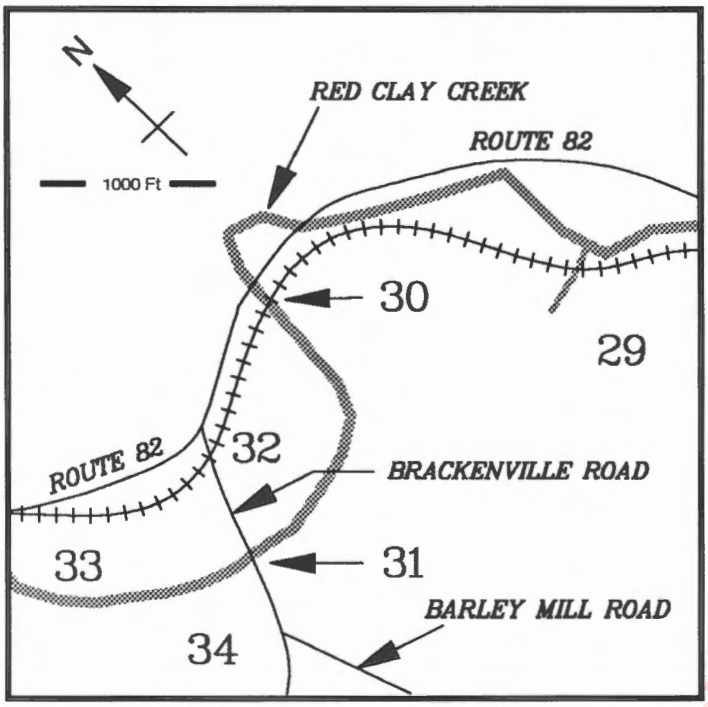
In 1804 the mill was sold to R. Philips and John C. Philips. The firm of Baldwin and Chandler next owned the mills followed by George Springer. Amos and Jehu D. Sharpless purchased the mill site in 1862. While owned by the Sharpless family, the mills were modernized using a rolling process that they had invented and patented. This modernization made the mills more efficient and able to produce a variety of brand names.

The next owner of the mills was George W. Pusey. George Pusey was born in Chester County



SHARPLESS ROAD - 1947
One of 35 built in 1901 by Rhode Island, #2012 was a Class B-18. Originally with a high-pressure, 23.5"x28" cylinder on the right and a low-pressure, 35.75"x28" cylinder on the left, all were changed to Class B-18a simple engines in 1908 with 21"x28" cylinders. The B&O's most powerful ten-wheelers, these engines provided 30,870 pounds of tractive power. #2012 became a Class B-18d when Baker valve gear was installed. The wooden truss bridge to the right was maintained by the B&O until the 1950's. It was a road bridge and not a railroad bridge.

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MAP #9 - ASHLAND

in 1868 and learned his trade in the Clifton Mills flour mill two miles upstream from Yorklyn. About 1898 he married Florence Sharpless, and shortly thereafter took over the Ashland Mills from the Sharpless Family. With railroad service available to distribute the mill's products, George expanded the business. Among names such as *Pride of Delaware, 4F, Ashland, Morning Star*, and *Fairy Queen*, a high grade flour called the *Pride of Ashland* became well-known. Later, in the early 1900's, the mills had contracts with a major milling company. When George Pusey died in 1943 the mill closed within a few weeks. In 1948 all the mill buildings were torn down and the mill race was bulldozed in.

34 ASHLAND NATURE CENTER

The Delaware Nature Society was founded in 1964 as a private, non-profit organization dedicated to environmental education and the preservation of natural areas. The Society operates two nature centers, both open year round. Their headquarters is at Ashland Nature Center while Abbotts Mill near Milford, Delaware serves residents of lower Delaware. Membership in the Delaware Nature Society has grown from a handful of concerned citizens to thousands of individuals and families from Delaware and the neighboring states of Maryland, Pennsylvania, and New Jersey.

The Ashland Nature Center is nestled among 600 acres of rolling meadows, pine and hardwood forests, marsh land, floodplain, streams, and ponds in Mill Creek Hundred. Short trails traverse the property allowing individuals the opportunity for self-guided tours to study geology, birds, insects, flora, and the natural beauty of the Red Clay Valley. The tracks of the Wilmington & Western cross the northeast corner of the property.

The main building includes not only the main offices for the Delaware Nature Society, but also includes an auditorium, 4000+ volume library, and the Nature Store that is stocked with many gifts, books, and training aids. A short walk from the main building is a lodge well equipped to host overnight groups participating in various Society sponsored classes and activities. A short distance from the Ashland Nature Center, on Brackenville Road, the Society operates the Nature Barn. The Nature Barn houses farm animals for educational exhibits.

The Delaware Nature Society publishes natural history information and acts as a clearinghouse for information about wildlife, plants, and environmental issues. Graduate students and working professionals from all over the nation regularly attend Ashland Nature Center sponsored courses and training programs that are offered jointly with the University of Delaware. With classroom and dormitory space available at Ashland, many school students each year participate in scientific field studies. Many of the Society's staff members serve in leadership roles on various state conservation and environmental committees and commissions. Many of the Society's members and staff have been recipients of local and national awards and recognition.

DELAWARE NATURE SOCIETY

The Ashland Nature Center is open seven days a week except holidays and welcomes visitors. Persons interested in obtaining information on the Society's educational programs, for children and adults from ages two through adult, are urged to contact the Society. Those interested in obtaining environmental information or joining the Delaware

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YORKLYN WATER TOWER
The water tank at Yorklyn was one of three on the original Wilmington & Western Rail Road. Holding about 18,000 gallons of water it was the only tank on the line that was gravity fed from springs located in the rocky hills behind the tank. Sitting on a quarter-mile length of straight track running parallel to Route 82, the Yorklyn Water Tower was a favorite location for photographers.

Nature Society are requested to contact the Society at either their Ashland or Abbotts Mill location. The Delaware Nature Society's phone number is 302/239-2334.

35 SHARPLESS ROAD & ROUTE 82 - EAST GRADE CROSSINGS

Both Sharpless Road and Route 82 intersect in a 'Y' a short distance to the east of the railroad tracks. The railroad tracks cross both roads with less than 300 feet of track between the two roads. While the roads are not heavily traveled, this crossing does represent some unique conditions for engine and train crews. The crews need to be alert for cars approaching from four directions while the length of the train occupies both roads at the same time.

West of the railroad track, between the Sharpless Road and the Route 82 crossings, is an old dam and part of the millrace that once served the flour mills located at Ashland. Three railroad bridges still remain that allow the railroad to cross the millrace that fed water from the dam to the mills. While most of the old millrace has been filled in downstream of the dam, a short section of the millrace is still in place at the dam. Two short railroad bridges cross what remains of the millrace southeast of Sharpless Road. A third railroad bridge is next to the dam.

A fourth bridge at the Sharpless Road and Route 82 crossing was constructed by the original Wilmington & Western Rail Road, not as a railroad bridge but as a private road bridge. This bridge was fourteen feet wide, had a five ton load limit, and was of wooden truss design. Originally constructed in 1872 and rebuilt in 1908 by the B&O, the bridge was rebuilt of concrete and steel in the 1950's.

36 YORKLYN WATER TOWER

Along this stretch of track that runs parallel to Route 82 was one of three water towers that served the old Wilmington & Western Rail Road. The water tower stood at the small clearing in the rocky bank. In addition to the water tower here, there were water towers in Wilmington and in Landenberg. Known as the *Yorklyn Water Tower* by railroad employees, this tower was sixteen feet in diameter and held about 18,000 gallons of water.

The water tower here was unique in that it was the only water tower on the Wilmington & Western that was fed from an underground spring. At the top of the hill east of the track a dam was erected above

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the height of the water tower. Spring water collecting behind the dam was piped to the tower, keeping it filled. The water tower was dismantled about 1960. All that remains are five stone piers that supported the water tower. A ditch passes under the railroad tracks carrying excess water from the old dam and tower to the Red Clay Creek.

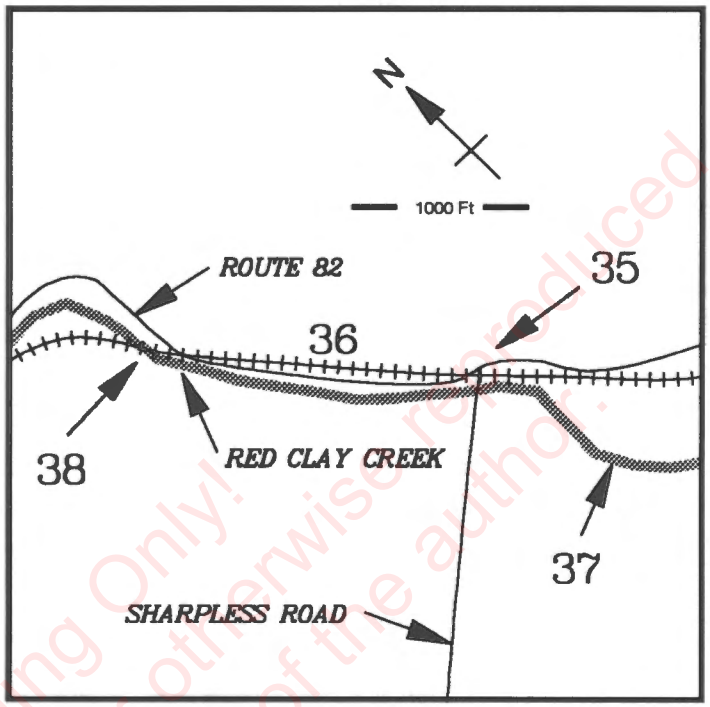
37 RED CLAY VALLEY ASSOCIATION

The Red Clay Valley Association, Incorporated (RCVA) was chartered in 1952 as a non-profit organization dedicated to maintaining and improving the water quality of the Red Clay Creek and its associated watershed areas. RCVA works in cooperation with such organizations as the Pennsylvania Department of Environmental Resources, Delaware Department of Natural Resources and Environmental Control, U.S. Geological Survey, U.S. Fish and Wildlife Service, Brandywine Valley Association, University of Delaware, Delaware Nature Society, and Historic Red Clay Valley, Incorporated on various projects.

RCVA is involved in such projects as studying and understanding the ground water flows in the Red Clay watershed area. The result of these studies, being conducted by the U.S. Geological Survey, will be a detailed computer-based model that can simulate changes in ground water flows as a result of proposed residential and commercial land development. Members of RCVA are involved in various other projects including studies on the zinc concentrations of the creek, creek sediment studies, and creek and tributary water quality monitoring.



The RCVA Education Committee is active in educating school children on various environmental issues through school programs and trips. The Scenic Red Clay Valley Committee each spring coordinates an effort to clean up the Red Clay Creek of its annual accumulation of trash and debris. Working in cooperation with NVF Company, Historic Red Clay Valley, Incorporated, Delaware Nature Society, and other organizations, a group of volunteers walk the creek as well as adjoining roads to recover several dozen tons of material and trash. For more information on the Red Clay Valley Association, Incorporated and their programs and activities contact the Association at 215/793-1090.



MAP #10 - ASHLAND to YORKLYN

38 RED CLAY CREEK & THE 'S' TRESTLE

When the route of the Wilmington & Western was being charted in 1869 it was decided that the mills and businesses along the Red Clay Creek offered more freight opportunities for the new railroad than an alternate route along Mill Creek. Since creeks and rivers flow gradually downhill, railroads often placed their rails near them to prevent having locomotives pull trains up steeper grades. The disadvantage of routing a railroad along a creek or river is that many trestles and bridges must be constructed.

Between Wilmington and Landenberg there were more than 50 bridges and trestles on the line. All of the original bridges and trestles were constructed entirely of wood. There was a hand cranked rotating iron bridge near Wilmington that crossed the Christina River. As the line was shortened, changed, and improved, the quantity of trestles and bridges was reduced. The original Wilmington & Western Rail Road's best known trestle was constructed at Broad Run, Pennsylvania. This trestle spanned 885 feet

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'S' TRESTLE IN DECEMBER
In the winter months, especially when the ground is snow covered, the landscape along the railroad takes on a different perspective. The rocky hills west of Wooddale become more apparent as the valley's features are highlighted. The dam to the right once supplied water to the lower Garrett Snuff Mill.

and towered 60 feet above the Broad Run Creek. When the line was shortened to Southwood in the early 1940's, the Broad Run trestle was removed.

Originally, there were 38 wooden trestles, wooden stringer bridges, or overhead bridges on the Landenberg Branch between Landenberg Junction and Valley Road, now the end of the line. Today, eight of the wooden trestles on the main track remain, and another two are on out-of-service sidings. In 1895 several wooden stringer bridges were converted to I-beam stringer bridges by the B&O. Those wooden stringer bridges that were not converted in 1895 were converted to I-beam construction in either 1907 or in 1917. B&O bridge records indicate that the railroad strengthened all of the bridges and trestles on the branch in 1907 and again in 1917 so that heavier locomotives and rolling stock could operate on the branch line. There are now fourteen I-beam bridges on the main track and one on an out-of-service siding. The only iron bridge remaining on the line is at Ashland. Six of the wooden stringer bridges or trestles have been converted to concrete pipes and three have been removed.

State roads cross above the railroad's right-of-way at two locations. A large steel bridge carries the six lanes of Kirkwood Highway across the railroad just north of Marshallton. This bridge also crosses the Red Clay Creek and both sidings that lead to the Haveg Division of Ametek. At the top of Hockessin Hill a pony truss bridge carries Old Wilmington Road over the Wilmington & Western's tracks. Since these bridges are part of the State's system of roads, both are maintained by the Delaware Department of Transportation. A third pony truss overhead bridge, removed in 1991, was located at Ashland and connected Brackenville Road with Route 82.

While wooden trestles and I-beam bridges provide passengers with an experience of a long gone era and enhance the beauty of the ride, they are very expensive to maintain. All of the Wilmington & Western's trestles and bridges, and the railroad's right-of-way, are listed in the National Register of Historic Places. Each year a significant portion of the Wilmington & Western's operating income is assigned to maintaining the track and trestles. The first concern is that the trestles remain safe for passenger trains. Our maintenance activities do not alter the original design or construction of a trestle or bridge even when significant replacement is necessary.

Known as Bridge 12B by the railroad, the old wooden trestle at Yorklyn is the longest and most distinctive wooden trestle remaining on the Wilmington & Western. This trestle is unique because as it crosses the Red Clay Creek, it takes the shape of an 'S'. This 'S' shape was necessary to connect the railroad tracks on the east side of the creek with those on the west side of the creek.

39 YORKLYN & YORKLYN STATION

In 1813 the original Garrett paper mill was sold to Thomas Lea. Mr. Lea owned a number of mills in New Castle

County, and he named each of them. The Garrett site was named Auburn Mills until 1826 when the name was shortened to simply Auburn. It is interesting to note that Joshua Heald, founder of the Wilmington & Western Rail Road and its first President, was born at Auburn. Joshua was born on May 26, 1826 in the stone home Horatio Gates Garrett built about 1804.

With the coming of the Wilmington & Western Rail Road in 1872 a station was built near the Garrett Snuff Mills. William E. Garrett was a Director for the new railroad and undoubtly influenced the location of the station. The railroad named the station *Yorklyn Station* and soon the community adopted the name Yorklyn. On June 13, 1873 the Postmaster General established a post office at Yorklyn Station. While the post offices that were established at Faulkland, Wooddale, and Ashland have since closed, the Yorklyn Post Office still exists and is located on Yorklyn Road a short distance west of where the road crosses the Red Clay Creek.

Yorklyn lies at the eastern end of a marble valley that extends west through Hockessin and ends about where Valley Road intersects Limestone Road (Route 7). The marble erodes more easily than the surrounding rocks and forms topographic lows. The railroad took advantage of these lows and built their tracks along the marble valley between Yorklyn and Hockessin.

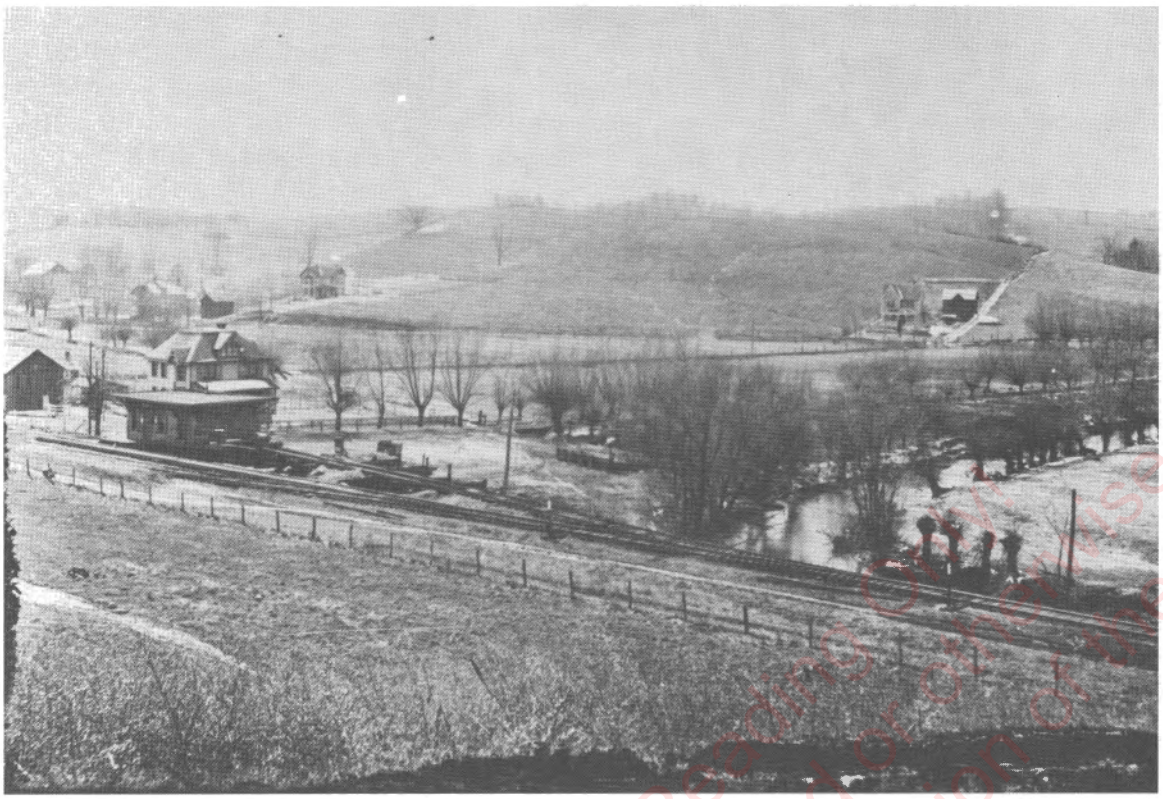
This marble is a white to pale-blue, coarsely crystalline, dolomitic marble that is called the *Cockeysville Marble*. When unweathered the marble can be cut and polished to form glistening white slabs. Early in the nineteenth century farmers found the marble could be converted to quicklime and spread on their fields to increase the yield of their crops. Marble deposits were eagerly sought by these early farmers who heated it in kilns, and either used it on their fields, or shipped it to other farmers on the eastern shore.

A significant role was played by the original Wilmington & Western Rail Road and later the Baltimore & Ohio Railroad in hauling processed lime to



WILMINGTON & WESTERN RAILROAD'S FIRST STEAM ENGINE - No. 92
One of 25 manufactured by the Canadian Locomotive Company in 1910 for the Grand Trunk Railway, this Class E-8 *Way Freight Mogul* was numbered 1017. Rebuilt with piston valves and a superheater in 1913 the engine was reclassified as an E-12. In August 1918 the American Locomotive Company replaced the boiler. When the Grand Trunk was taken over by the Canadian National Railways in 1923, the classification was changed to Canadian National Class E-10a, and the locomotive's number was changed to 919. In 1951 all of the 2-6-0's were renumbered to clear the old three-digit numbers for assignment to diesels and #919 was given the new number, 92. Operating until the late-1950's, these steam engines were the last operating steam locomotives on the Canadian National Railways. Purchased by HRCV in 1959, No. 92 was stored in one of the old Garrett Snuff Mills while being re-flued and certified for passenger service by the Interstate Commerce Commission in 1965. No. 92 was the first steam locomotive operated on the Landenberg Branch by the Wilmington & Western when Historic Red Clay Valley, Incorporated started operations in 1966. When leaks appeared in the firebox crown sheet in the mid-1970's, No. 92 was taken out of service. Future plans for the restoration of the iron horse wait for funding. In the meantime No. 92 sits idle in Marshallton Yard.

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YORKLYN STATION IN 1903 In 1872 when the railroad was built the only business in the area were the Garrett Snuff Mills (located to the right in this photo but out-of-view). With the building of the station, the community's name changed from Auburn to Yorklyn. Ten years after this photo was taken the station would be surronded by buildings belonging to the National Fiber & Insulation Company (now NVF).

the Port of Wilmington for shipment up and down the east coast. Today the Cockeysville Marble is no longer used in agriculture or construction but is an important source of ground water for the Hockessin-Yorklyn Valley. Over a million and a half gallons of water are pumped from the wells in Hockessin daily.

40 GARRETT SNUFF MILLS

When Columbus made his second voyage to America, he discovered that the American Indians took the wide leaves of the tobacco plant and dried them. The dried leaves were then either ground up and made into smoking materials for pipes, or were pulverized into a fine powder that was sniffed into the nostrils for medicinal purposes. It was not long before the practice of pulverizing dried tobacco leaves into snuff and inhaling it into the nostrils became an upper class status symbol in France, Italy, and England. The demand for snuff in Europe allowed the colonies to export hundreds of thousands of pounds of tobacco annually and reap generous profit. In fact the demand for tobacco played a major part in shaping the economic, social, and political lifestyles of the South. By the 1750's snuff milling had begun in the colonies.

As sniffing snuff lost favor in Europe, Americans were beginning to practice the habit. After the Revolution, a significant change occurred in the use of snuff in America. Americans found that by placing snuff in their cheeks, the same sensations could be obtained while leaving their hands free for work. As the practice caught on, more and more Americans began to use snuff causing the demand to explode. Varieties and mixes abounded and anyone with a mill and a supply of tobacco entered the snuff milling business.

In 1726 John Garrett purchased 256 acres of land where the Red Clay turns back upon itself. He recognized that this stretch of the creek would be an ideal location for one or more mills. In 1731 he and four partners constructed a saw and grist mill on a section of land that he sold to the partnership. The only other mills on Red Clay Creek when the Garrett mill was completed were the mills at Ashland, Greenbank, and in Stanton.

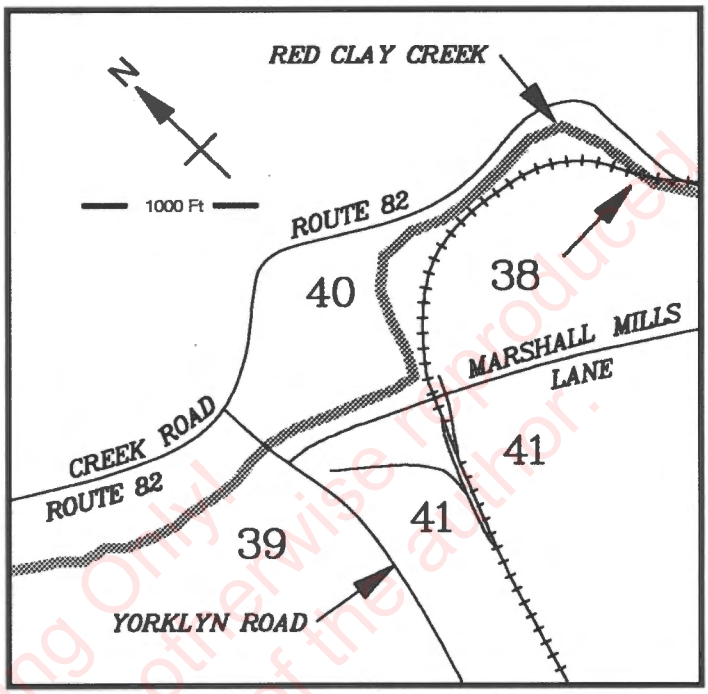
By 1741 John had sold his one-fifth share of the partnership and constructed his own mill on his own land a short distance from the mill the partnership had built. When he died in 1757 he left his mill and farm to one of his sons, John Garrett, II. John Garrett, II expanded the Garrett land holdings to more than 400 acres, but competition from the mills on the Brandywine River was making the milling business less profitable each year. In 1782 John decided to

enter the snuff milling business and he built a snuff mill near his grist mill. John Garrett, II established himself as a fine manufacturer of snuff and his snuff business prospered as word of his product spread.

John continued to expand his snuff milling business, and by 1795 he had constructed a second snuff mill. One of his eleven children, John Garrett, Jr., became interested in the paper milling business. John II converted his grist mill into a paper mill and turned it over to John, Jr. to operate. About 1804 after John, Jr. had moved to Ohio (and founded Garrettsville), John II divided his mills between two more of his sons. Horatio Gates Garrett became owner of the paper mill and Levi Garrett was given the snuff mill operation.

When competition from the Brandywine River mills made the milling of paper on the Red Clay Creek unprofitable, Horatio Gates Garrett sold the mill and moved to Ohio as well. After passing through several owners, the paper mills were purchased by Israel and T. Elwood Marshall in 1889. The sale of the paper mill to the Marshall brothers provided them with what they needed most to develop a vulcanized fiber industry in Yorklyn.

Levi Garrett operated the snuff mill until his death in 1833 when he left the milling business to his two sons, George Garrett and William E. Garrett. George sold his half share in the business to his brother William a short time later. Over the next forty years William slowly built the snuff milling business at Yorklyn and by the 1880's there were four snuff mills in operation.



MAP #11 - YORKLYN

In 1846 William rebuilt and expanded the existing mills into a single complex that was three stories tall. Three years later a second four-story mill was built. When the Wilmington & Western Rail Road arrived in 1872 the business again prospered and a third mill was constructed in 1874. In addition to building a third mill, William added steam engines to add to the power of the water wheels. Ten years later a fourth mill was added in addition to railroad sidings to further increase the capacity of the Garrett snuff enterprise.

When William E. Garrett died in 1885 at the age of 87, he left the snuff business to his two sons, William E. Garrett, Jr. and Walter Garrett. When Walter died ten years later he willed his half interest in the snuff milling business to his brother William, Jr. and his $6,000,000 in assets to his wife Henrietta. By 1900 the Garrett mills were producing 3.5 million pounds of snuff annually which composed one-quarter of the world's supply. The Yorklyn snuff mills were the largest snuff milling operation in the world. Wealthy,



No. 92 AT YORKLYN STATION
When the Wilmington & Western started operating on the Landenberg Branch in 1966 it was only to Mt. Cuba. In September 1967 the first trip to Hockessin occurred and No. 92 stopped at Yorklyn Station. This would be the last time a steam engine would visit Yorklyn Station in its original location.

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and not interested in remaining in the snuff milling business, William, Jr. sold the company to three loyal employees for $1.00 each! William, Jr. died unmarried at the age of 66 in 1901.

While there were no Garretts that remained in the snuff milling business, the Garrett legacy did not end with the Garrett brothers' deaths. When Walter died in 1895 he left explicit instructions with his wife Henrietta that she was to write a will. When Mrs. Garrett died in 1930 she was worth 30 million dollars. Like her husband, Mrs. Garrett had not written a will and it took the courts nearly 20 years to decide the outcome of the estate from more than 26,000 *claimed* relatives and descendants.

The three employees that bought the mills from William, Jr. sold their interests in 1907 to the American Snuff Company. In 1911 the government ordered the American Snuff Company to divest of its monopoly holdings and the George Helme Company received the Yorklyn Mills. In 1920 the lower snuff mill was sold to the Crowell Corporation that used the building to manufacture gummed tapes. This mill was eventually destroyed by fire in 1964.

The remaining three snuff mills have played host to many businesses since snuff manufacturing stopped in 1954. In 1959 Tom Marshall, one of the three founders of Historic Red Clay Valley Incorporated, purchased a 2-6-0 Canadian National Railways locomotive. He stored the locomotive in one of the snuff mills, and between 1960 and 1965 a crew of volunteers rebuilt it. In 1965 Tom negotiated a lease with the B&O railroad to operate weekend and holiday tourist trains on their Landenberg Branch. Rebuilt steam locomotive No. 92 began pulling Wilmington & Western coaches in May 1966. Recently the mills were historically renovated for use as office condominiums.

41

NVF COMPANY

Yorklyn's second industry, the manufacture of vulcanized paper, fiber, and materials, still claims Yorklyn as its home. This business was born in the Marshall Paper Mills located on the Red Clay Creek just over the Delaware and Pennsylvania border, but it grew into a thriving industry in the Garrett Paper Mill.

In 1763 John Marshall established a flour and saw mill on the banks of the Red Clay Creek just above the Delaware State line where the creek splits. John passed the business on to his son Robert and later Robert passed the flour and saw milling business on to his son, Thomas S. Marshall. By 1856 Thomas S. Marshall had converted the flour mill into a paper mill and was producing a wide variety of high quality papers. When the paper mill, now known as the *Homestead Paper Mill*, burned in 1865 it was rebuilt as a much larger facility.

In 1859 vulcanized fiber was invented by Thomas Taylor in England. Taylor discovered that paper, which had been specially manufactured to the consistency of blotter paper, could be further processed to alter and improve the paper's characteristics. The process started by soaking cotton-waste based blotter paper in zinc chloride. The zinc chloride was found to act as a catalyst to densify the cellulose in the paper and improve its characteristics. After passing several sheets of the paper through zinc chloride the sheets were pressed together to form a thicker sheet of material. Next the zinc chloride was washed from the densified paper and then the paper, now called vulcanized fiber, was dried. The resulting cellulose-based product was a material that offered many desirable characteristics.







W.E. GARRETT & SONS TRADEMARKS
The Garrett trademark (right) reflects the year that John Garrett, II started milling snuff. Scotch Snuff (center) was a brand manufactured by the Garretts and was one of their more poplar products. When the George Helme Company acquired the Garrett Snuff Mills, they marketed snuff made at Yorklyn under both the Garrett and Railroad Mills name (left).

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The fiber is an excellent electrical insulator, can be manufactured in various thicknesses and sizes, does not decompose when exposed for long periods to water and other liquids, is tough and durable, and is workable with ordinary woodworking machinery. While vulcanized fiber is typically a neutral gray color, dyes can be added to change the color to black, red, or practically any other desired color. Vulcanized fiber soon became the raw material used in the making of such articles as suitcases, shipping drums, and various electrical insulators.

When Thomas Taylor could not interest English paper manufacturers in the manufacture of vulcanized fiber, he came to the United States in the late 1860's. The process for the manufacture of the newly developed product was patented in March 1871 (patent 114,880), and a charter to manufacture vulcanized fiber was granted in June 1873. In 1875 the Vulcanized Fiber Company was incorporated in Wilmington under the laws of the State of Delaware as the first vulcanized fiber manufacturing plant in the United States.

Soon additional fiber companies were starting up in Delaware making New Castle County the vulcanized fiber capital of the world. Needing large amounts of paper to manufacture the completed product, several vulcanized fiber manufacturers turned to the Marshall brothers to produce paper expressly for the vulcanized fiber industry. The Marshall brothers experimented with the paper manufacturing process and mastered the intricate details of making paper suitable for conversion into vulcanized fiber. The demand for their specially-blended vulcanized fiber papers flourished and by the late 1880's they were beginning to need to expand into a larger mill facility.

A short distance down the Red Clay Creek events were occurring that would soon provide the Marshalls with another mill site that could be used to manufacture vulcanized fiber paper. The Garrett paper mill at Yorklyn was sold to Thomas Lea when Horatio Gates Garrett moved to Ohio. Lea renovated the mill and produced cotton yarn for several years. The mill was again sold, this time to Jacob Pusey. After the Civil War, Pusey sold the mill and land to William and James Clark who converted the cotton



NVF COMPANY TRADEMARKS
The indian-head trademark at the left is from the early years of the National Vulcanized Fiber Company. The trademark to the right currently appears on all NVF stationary and literature.





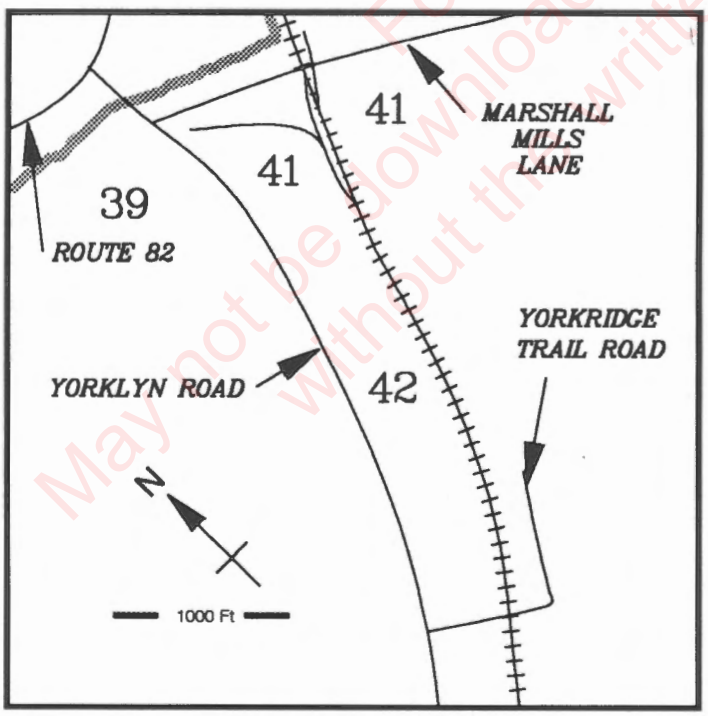
NATIONAL FIBER & INSULATION COMPANY
From its beginnings in 1904 the company rapidly expanded. Construction started in 1910 with the buildings to the right. In 1912 the buildings on the left were constructed across from Yorklyn Station. The buildings 'above' Yorklyn Station in this 1914 photograph are the Garrett Snuff Mills.

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milling machinery to produce wool yarn. When the milling of wool yarn did not prove successful, the mill and about one hundred acres of land were sold to William Clark's son-in-law, S. Franklin Ewart.

As the mill was nearly destroyed by a fire just before sale, Ewart sought out Israel and T. Elwood Marshall in hopes of forming a partnership. Franklin Ewart knew the Marshall brothers were familiar with papermaking at Marshall's Mill in Kennett Township, and he hoped the old Garrett mill could be returned to a paper mill. In late 1889 the partnership purchased and converted the old Garrett mill back to the manufacture of paper. Two years later Franklin Ewart, his investment returning a good profit, sold his interests in the Yorklyn mill to the Marshall brothers.

By the turn of the century the Marshalls had become interested in the actual manufacture of vulcanized fiber and not just the paper that was used to make the fiber. As a result of their contacts in the fiber business, they conceived the idea of a machine that could make vulcanized fiber and papers in a continuous process. They developed and constructed such a machine, had it patented in 1900, and made the first continuously produced vulcanized fiber in the world. As the vulcanized fiber industry grew, a new mill known as the *Insulite Mill* was constructed in 1901. This new mill was built near the old Garrett paper mill and was built specifically to house the newly patented fiber machinery necessary to convert vulcanized fiber paper into vulcanized fiber.



MAP #12 - YORKLYN

When it became obvious that the current mill site could not be expanded to provide the space necessary to increase the profitable business, a large farm next to the Garrett snuff mills located downstream was purchased. With this expansion the Marshall Brothers, Incorporated created the National Fiber & Insulation Company in 1904. In 1910 National Fiber & Insulation built additional mills near the tracks of the B&O Railroad across from the railroad station on fifteen acres of land.

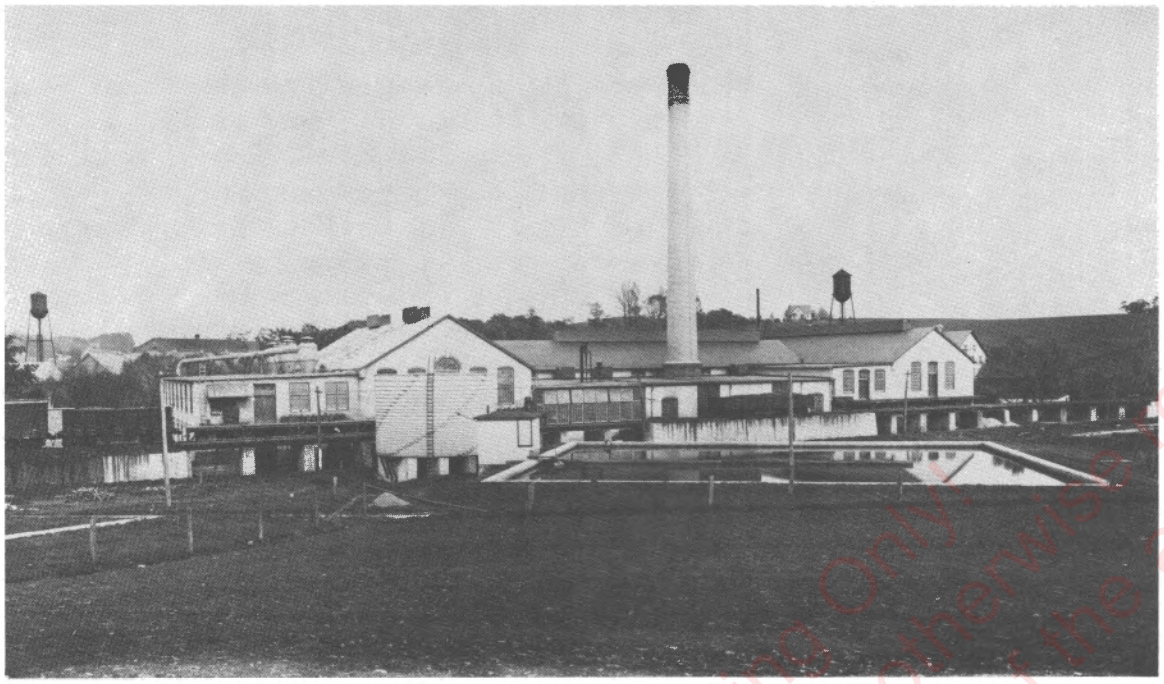
By 1912 new mills southwest of the railroad station had the distinction of operating the longest vulcanized fiber line in the world. This distinction is still true with one of the Yorklyn Plant lines having nearly 34 miles of fiber in continuous production. In 1922 the National Fiber & Insulation Company of Yorklyn combined with the American Vulcanized Fiber Company of Newark, Delaware and the resources of both companies formed the National Vulcanized Fiber Company. National Vulcanized Fiber Company became, and remains, the world's largest vulcanized fiber manufacturing company.

As the company continued to prosper additional plants were opened and new products were introduced. In 1925 the Phenolite Company was organized and established in Kennett Square, Pennsylvania to manufacture laminated bakelite products. In the late 1970's the company began to manufacture circuit board material for the electronics industry. Now known as NVF, the company employs nearly 2000 workers in plants in Pennsylvania, Georgia, Illinois, California, and Maine. Recently NVF has expanded into the manufacture of a wood based veneer product line that has gained wide acceptance in the furniture and woodworking industries. The veneer product that NVF markets is a distant relative of the original vulcanized fiber material originally produced by the Marshall brothers.

The buildings along the railroad tracks in Yorklyn are the manufacturing and office buildings of the NVF Company. Yorklyn remains the company's headquarters. The buildings date from the turn of the century and hint of early twentieth century manufacturing practices. Through continuous process improvement, the NVF Yorklyn site takes advantage of some of industry's waste.

A portion of the Yorklyn Plant's vulcanized fiber is manufactured with waste blue denim material originally discarded by jean manufacturers. Other products are partially based on waste newspapers,

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NATIONAL FIBER & INSULATION COMPANY
This view, looking northeast, shows the railroad siding and docks in 1914. The railroad siding, identified on B&O maps as Bridge 12F, was a trestle. At ground level parallel to the siding are the West Chester, Kennett, & Wilmington Electric Railway tracks connecting Kennett Square and Brandywine Springs.

computer printer papers, and similar non-sized paper products. Through conservation projects the Yorklyn Plant recycles nearly 99 percent of the production process waste materials back into the production process itself. In effect NVF has turned the manufacture of vulcanized fiber products at Yorklyn into a recycling operation. NVF not only relies on a heavy percentage of recycleables for raw materials, but they recycle the plant's waste directly back into making new finished product.

One of NVF's best known products is FORBON®, a chemically pure cellulose material containing no resins or bonding agents. It has a high internal bond strength, a good resistance to most oils, gasolines, and solvents, is heat resistant, and has an electrical insulator temperature rating of 115 degrees centigrade. FORBON® is manufactured at the Yorklyn Plant in a number of grades and forms and is sold as sheet stock, rods, tubes, and roll stock.

If you have ever used a disk sander or similar high speed sanding machine that relies on sanding disks, chances are the disk material that is coated with abrasive grit may have been made at Yorklyn. Most newer homes today use circuit breakers in the main electrical power panel, but older homes may still rely on fuses in the electrical power panel. If the home still has a fuse-type power panel, more than likely cartridge fuses are used for the kitchen stove, electric hot water heater, and similar heavy load circuits. Many cartridge fuses are manufactured using NVF vulcanized fiber products in the construction of the fuse tube.

Perhaps one of the best testimonials to the quality and durability of FORBON® is that it is the material selected by many railroad signal equipment manufacturers to insulate railroad signal circuits. FORBON® is specifically manufactured, machined, and formed to the contours of railroad rail. It is installed as part of the actual rail joint assembly to insulate various railroad signal circuits. The characteristics of the material allow it to withstand the year-round out-of-doors environment. FORBON® is not destroyed by heavy railroad locomotives and cargo laden freight cars rolling over the rail joints it is installed in. The Wilmington & Western uses FORBON® in NVF's backyard as the insulating material for all highway grade crossing signal systems.

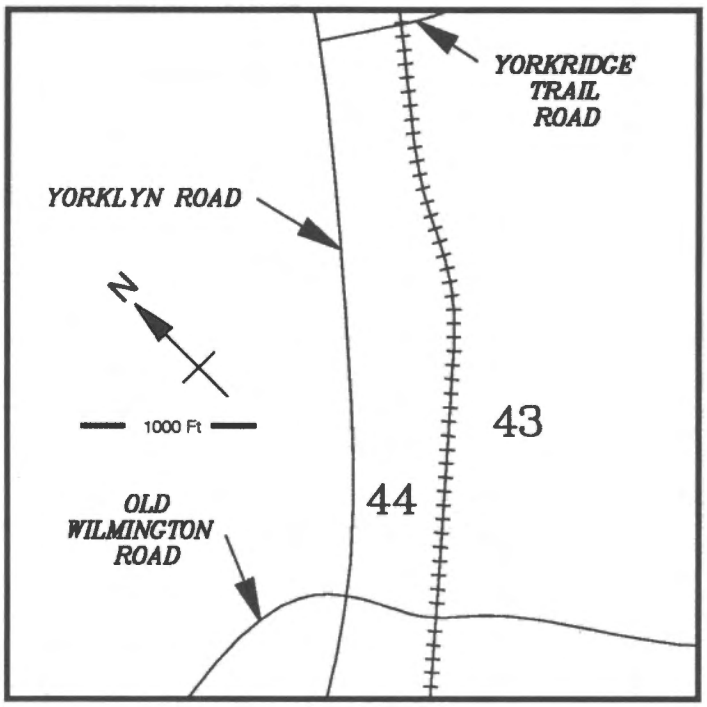
42 GREGG'S BUSSES

Gregg's Bus Service is well-known in northern Delaware. Formed in 1946, Gregg's calls Yorklyn its home. Buses belonging to the Gregg fleet carry thousands of school, church, social organization, and corporate individuals to destinations along the eastern seaboard.

43 HOCKESSIN HILL

Between Yorklyn and Hockessin the railroad leaves the Red Clay Valley along the steepest grade remaining on the railroad. Known as

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MAP #13 - YORKLYN to HOCKESSIN

Hockessin Hill by the railroad, locomotives must pull the train up a one and a half percent grade for about a mile to leave the Red Clay Valley. What makes this grade even harder to climb is that the track makes an 'S' curve before reaching the top of the hill. At the top of the hill a timber pony truss bridge carries Old Wilmington Road over the railroad tracks. The top of Hockessin Hill is 279 feet above sea level and is the highest point on the Wilmington & Western Railroad today. The length of track from the end of the 'S' curve to just past the Old Wilmington Road pony truss bridge is the longest length of tangent track on the remaining portion of the original Wilmington & Western Rail Road.

44 GOLDING'S QUARRY

In 1820 narrow veins of a very high-grade snow-white clay containing kaolin were discovered in the Cockeysville Marble in Delaware and Pennsylvania. While clay composed of kaolin is very common, the kaolin found in the Cockeysville Marble deposits is especially white. This purity of color made much of the kaolin clay found in the Hockessin Valley highly valued in the manufacture of fine china.

When the route of the Wilmington & Western was being proposed, quarry owners in Hockessin and Southwood, Delaware, and in Eden and Broad Run, Pennsylvania, strongly backed the venture. The quarry operators offered the waste dirt and material from their mining operations free to the new railroad to use as fill. Many stretches of the Wilmington & Western were filled and leveled with quarry waste from the kaolin quarries.

The high grade clay was dug from open pit mining operations during much of the late 19th century and the early part of the 20th century. Until the railroad came, oxen drawn wagons transported the mined clay over the Lancaster Pike and the Newport-Gap Pike. Hauling the mined clay from Hockessin and from mines west of Hockessin was one of the major freight businesses of the Wilmington & Western Rail Road and later the Baltimore & Ohio Railroad. Old railroad records show that many tons of clay, and hundreds of thousands of fire bricks were shipped by rail. The clay was taken by rail to the Delaware River where it was shipped to pottery manufacturers. If the clay was not pure enough to be used in the manufacture of porcelain and fine china, it was placed in molds and fired in a furnace to form fire bricks.

Near the top of Hockessin Hill before the Old Wilmington Road overhead bridge is a large abandoned kaolin pit that can be seen from the railroad. Several other pits, filled with water, are located between Old Wilmington Road and the Lancaster Pike - Route 41. These open pits remain from the Golding & Son mining operation, and are typical of those found in the Hockessin Valley. During the mining operation water would continuously seep into the mining pits and it was necessary to remove the water with pumps. When the Golding mining operations stopped in 1934 the open pits filled with ground water. In the woods a short distance from the tracks you will see an old brick smokestack that was part of the Golding & Son quarry power house.

45 LANCASTER PIKE/ NEWPORT-GAP PIKE - ROUTE 41

In 1807 the Pennsylvania Legislature authorized the building of a road branching off the Philadelphia and Lancaster Pike (now Route 30) at Gap Tavern in Lancaster County. The road was to begin near the tavern and end at the navigable waters of either the Delaware River or the Christina Creek. The legislature authorized the road to be built to

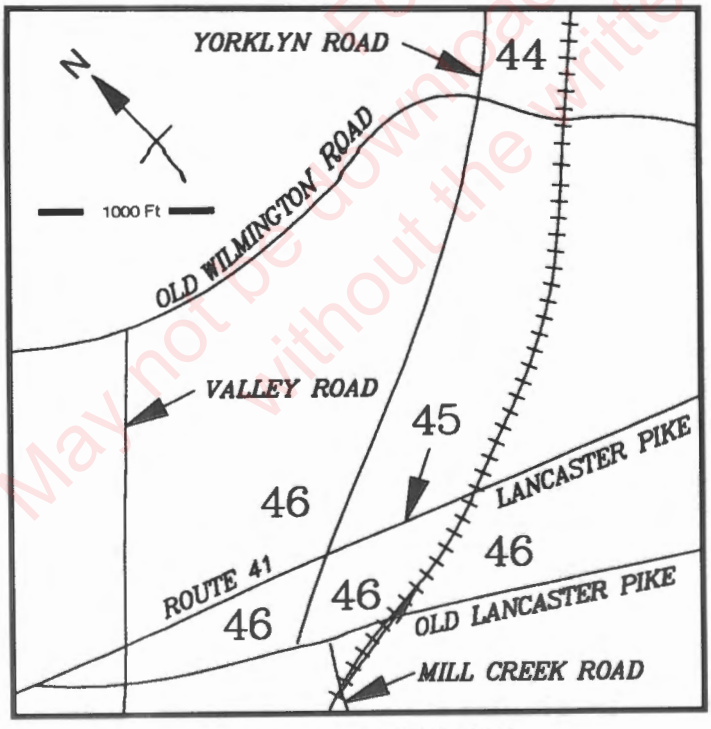
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No. 98 AT NVF Built as a 4-4-0 wheel configuration in 1909 by the American Locomotive Company at their Schenectady Works, No. 98 is the last surviving example of an ALCO American. There were thousands of 4-4-0 iron horses built until the early 1900's, and today only about four dozen remain. Most are stationary exhibits and few are still operated. No. 98 is probably the only one routinely run as originally built!

the Pennsylvania and Delaware state line when the Delaware Legislature passed a similar act to continue the road to its final destination. In 1808 the Delaware Legislature formed the Gap & Newport Turnpike Company to build Delaware's portion of the road from the state line to Newport, Delaware.

The cleared path for the new road was 100 feet wide while the actual roadbed was to be 20 feet in width. The road's construction was *to be composed of road stone, gravel, clay, or other proper materials, compacted together to a sufficient depth to make a solid foundation, and faced with clay, gravel, or stone, in such a manner as to secure a firm and even surface, rising towards the middle by a gradual arch.* Persons using the road for worship or funeral services were not required to pay the toll and the State could purchase the roadway at any time.



MAP #14 - HOCKESSIN

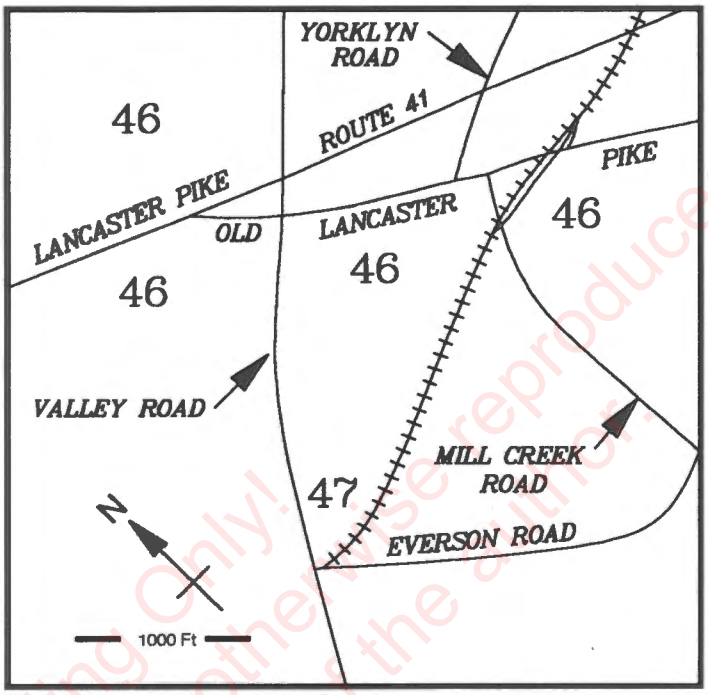
One year after authorizing the construction of the Gap & Newport Turnpike, the Delaware Legislature formed the Wilmington Turnpike Company. This company was authorized to *construct a turnpike from the borough line of Wilmington, through Christiana Hundred, to a point near the center of Mill Creek Hundred where the new turnpike was to join the Gap & Newport Turnpike.* This new turnpike was named Lancaster Pike. By the 1820's both turnpikes were in operation. Both were operated as toll roads until 1877 when the company charters for both organizations were repealed. In Delaware the roads were placed under the control of the Levy Court of New Castle County.

Today Lancaster Pike remains the name for the section of road that runs from Gap & Newport Turnpike (now called the Newport Gap Pike) to Wilmington. This section of the road is also known as Delaware Route 48. The Wilmington & Western

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Railroad crosses Lancaster Pike just south of Wooddale.

The section of the original Gap & Newport Turnpike running southeast from the junction with Lancaster Pike is now called *Newport Gap Pike*. The short section of the original Gap & Newport Turnpike running northwest from the junction with Lancaster Pike is usually called *Lancaster Pike*, however some Delaware maps may call this section of the road Newport Gap Pike as well. In either case, the entire original road that connects Gap, Pennsylvania with Newport, Delaware is known as *Route 41*. The Wilmington & Western Railroad crosses Route 41 twice. One crossing is in Hockessin and the second is at Greenbank. The distance in road miles between the two crossings is about five miles while the railroad travels more than eight miles to connect the same two locations.



MAP #15 - HOCKESSIN to END-OF-LINE

46 HOCKESSIN

Hockessin was a typical small farming community in the late 1700's and early 1800's. Originally the community was known as *Okessin,* a word of Algonkian derivation. Later changed to Hockessin, the new name for the town was derived from an indian word that means *good bark*. The indians gave the area this name because of the excellent quality of the white oak trees that grew there.

A group of Quakers settling in Mill Creek Hundred in 1737 established Hockessin Friends Meeting House as a place of meeting and worship. Close by was built a school house, octagonal in construction so that all desks could face the center of the room. The area supported mostly agriculture until John G. Jackson opened a limestone quarry. With the opening of the quarry, other businesses came to



B&O #2012 AT GOLDING'S QUARRY
With only a caboose, #2012 heads down Hockessin Hill on the way back to Wilsmere Yard in 1947. One of Goldings abandoned open kaolin pits is in the background. This pit, located just east of Old Wilmington Road, still holds water and is a favorite fishing hole for kids. In the background is the smokestack from the powerhouse that once served the quarry. In 1992 the stack is still standing, but only partly visible as trees have grown to cover most of the area.

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FLYING SWITCH IN HOCKESSIN
B&O #2012 performs a flying switch in Hockessin in 1947. A flying switch was a railroad maneuver where a car was released to a siding from a moving train. A brakeman riding the car used the car's hand brake to stop it. The conductor operated the switch allowing the car to enter the siding. He then threw the switch to keep the train moving on the main track. Flying switches were dangerous and are now illegal.

Hockessin. The discovery of rich beds of kaolin in the area brought additional industry to the valley as derricks sprang up everywhere. With the coming of the Wilmington & Western Rail Road in 1872 and the building of a railroad station, the community moved a half-mile west to be nearer the new station. The mining of kaolin clay and limestone, and its shipment over the rails of the Wilmington & Western Rail Road and B&O railroads, lasted until the early 1930's. When the mines played out, most of the industrial businesses in Hockessin left. Hockessin was one of the busiest stations along the line for both passenger and freight traffic. As business left the community railroad traffic declined and the B&O stopped passenger service. Today, Hockessin is one of the area's better known residential communities.

47 WESTERN TERMINUS OF THE LANDENBERG BRANCH

In the 1920's the profitability of the Landenberg Branch began to decline. In 1931 the B&O stopped passenger service and only freight trains climbed Hockessin Hill. When the Pennsylvania Railroad abandoned its Pomery & Newark line in the early 1940's, the B&O abandoned all operations west of Southwood, Delaware just east of the Delaware-Pennsylvania state line. For years the B&O stored freight cars on the tracks between Hockessin and the end of the track at the state line. In 1957 the B&O removed a string of 70 stored freight cars and abandoned the line between Valley Road and Southwood. Tracks were removed and Hockessin became the western terminus for the Landenberg Branch.

As Hockessin Supply Company's reliance on the B&O for coal and lumber shipments decreased in the 1960's, the tracks from Yorklyn began to experience reduced railroad traffic. On September 9, 1967 Historic Red Clay Valley, Incorporated operated the first passenger train to Hockessin in 18 years. The occasion also marked the first time a steam engine had returned to Hockessin in many years.

Years have passed since a revenue freight car was pulled up Hockessin Hill to supply a customer. The communities of Southwood, Eden, Broad Run, and Landenberg will never again experience the sights, sounds, and smell of an iron horse moving through the meadows, woods, and valleys. It has been the efforts of Historic Red Clay Valley, Incorporated and its volunteers that have kept the Landenberg Branch from becoming a historical memory like much of the industry that once thrived in the Red Clay Valley along the route of the original Wilmington & Western Rail Road.

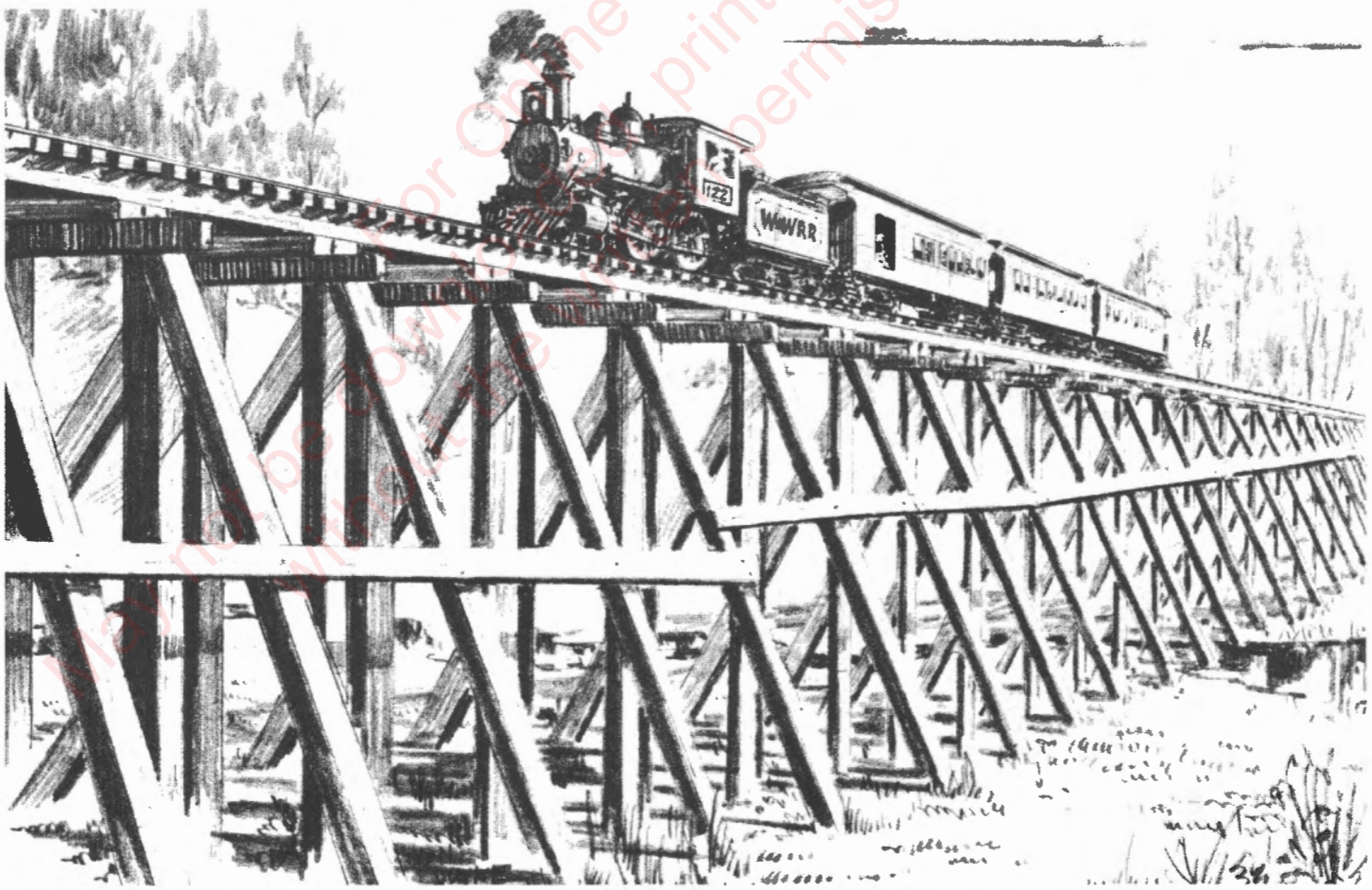
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HISTORIC RED CLAY VALLEY, INCORPORATED

Historic Red Clay Valley, Incorporated (HRCV) is a private, non-profit membership organization formed on March 1st, 1960. The mission of HRCV is to preserve the historical, natural, cultural, and industrial heritage of the Red Clay Valley. This mission includes the valley's historic buildings and sites, its social and economic institutions, and the ecology of its lands and waterways. The organization's most active project is operating the Wilmington & Western Railroad to provide a living awareness of the region.

Thomas C. Marshall, Jr. of Yorklyn formed HRCV after he purchased a 2-6-0 Canadian National locomotive in 1959. Over the next several years a group of volunteers rebuilt the locomotive, N0. 92, in one of Yorklyn's old Garrett Snuff Mills. Tom worked to secure a lease with the Baltimore & Ohio Railroad (B&O) to operate steam powered tourist trains along the B&O's Landenberg Branch. During No. 92's rebuild and the B&O negotiations, HRCV purchased three Delaware, Lackawanna, & Western Railroad Boonton Coaches. In need of restoration, another group of volunteers began working on the coaches in a 7th Street warehouse in Wilmington. In late 1965 the group's efforts were beginning to pay off. Locomotive No. 92 was back under steam, the Boonton Coaches were ready for passengers, and the B&O had signed a lease for the following year.

The three-day opening weekend for the new steam tourist line was May 28th, 29th, and 30th, 1966, the Memorial Day weekend. Trains ran hourly to the Mt. Cuba Picnic Grove from Greenbank Station. Operations continued and passenger ridership increased. The following year HRCV members chopped through the undergrowth that



ARTIST'S SKETCH OF WILMINGTON & WESTERN TRAIN CROSSING BROAD RUN TRESTLE IN 1872

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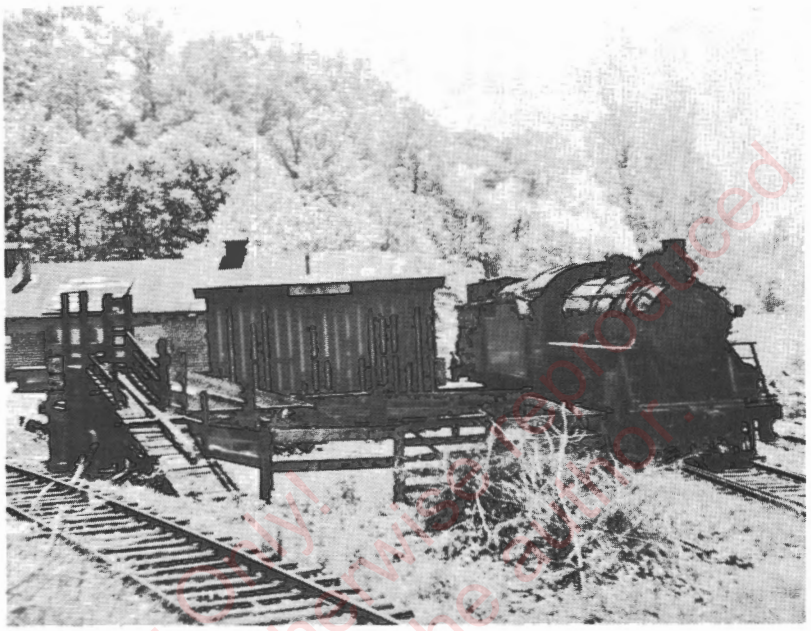
had grown over the rails between Yorklyn and Hockessin. On September 9th, the first steam powered passenger train in many years returned to Hockessin. Steam passenger trains have operated on the Landenberg Branch between Greenbank, Mt. Cuba, Yorklyn, and Hockessin nearly every weekend during the Spring, Summer and Fall since No. 92 first made the trip in 1966. Since 1989 the Wilmington & Western Railroad has been one of Delaware's twenty most popular tourist attractions.

Since its founding in 1960 and the start of railroad operations in 1966, HRCV has been involved in many diverse projects. Members worked to rebuild Greenbank Mill after a fire nearly destroyed the historic landmark in 1969. HRCV was instrumental in working with State officials to have Wooddale Covered Bridge rebuilt after a fire in 1965. When Yorklyn Station was about to be destroyed, HRCV secured permission to move the structure to Greenbank and preserve it. Locomotive No. 98, the last example in existence of an American Locomotive Company (ALCO) American Class 4-4-0 locomotive, has been restored by HRCV to operating condition and routinely pulls passenger trains along the Landenberg Branch.

One of HRCV's biggest projects was the actual purchase of the Landenberg Branch from Chessie (formerly the B&O) after the B&O filed with the Interstate Commerce Commission (ICC) to abandon and remove the tracks. After a massive fund raising effort, the 75 acres of land making up the Landenberg Branch, was purchased from Chessie. In 1982 Yorklyn Station, the Landenberg Branch right-of-way including all track and trestles, locomotive No. 98, and the four Boonton Coaches all became the first railroad and railroad equipment to be added to the National Register of Historic Places.

HRCV members continue to be active in the goals of the organization's charter. Working with the Delaware Nature Center, Red Clay Valley Association, Greenbank Mill Associates, and local residents and industry, HRCV members continue preserving the historical, natural, cultural and industrial heritage of Delaware's Red Clay Valley. HRCV is always searching for new ways to fulfill the organization's mission and suggestions are welcome.

Membership in HRCV is open to anyone who shares an interest in the organization's goals. Many members volunteer time to help in operating the railroad's busy schedule of events and special charters. Besides operating passenger trains, members may participate in a wide variety of support functions including equipment and track maintenance, equipment restoration, gift shop sales, ticket sales, publicity, fund raising, educational programs, tree and brush trimming, as well as the recruitment of new members. Historic Red Clay Valley, Incorporated can use any skill or profession in its many programs, and the organization offers rewarding opportunities for members to learn new skills.



LANDENBERG STATION - END OF THE LINE
Baltimore & Ohio locomotive #2061 sits at Landenberg Station in July 1941 waiting to return to Hockessin to pick-up the rest of the train . The track to the left leads to a coal siding. The track to the far right belonged to the Pomery & Newark Railroad before the line was purchased by the Pennsylvania Railroad.

Various levels of membership are available in HRCV and membership applications may be obtained from any member, on any train, or by contacting the business office. All members, whether they choose to perform volunteer work or not, receive many benefits. These benefits include discounts on fares and rentals, a subscription to the newsletter, **THE LANTERN**, complementary tickets or season passes, and an invitation to our private banquets and picnics.

Join us today.....

Historic Red Clay Valley, Incorporated
1601 Railroad Avenue
P.O. Box 5787
Wilmington, Delaware 19808
302/998-1930

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Suggested References

Sources of information for Red Clay Valley Rails were varied and many. A majority of the information came either verbally or from materials supplied by members of Historic Red Clay Valley, Incorporated, an organization dedicated to preserving the history of the Red Clay Valley. Another major source for information were the many books written about Delaware that are located in the University of Delaware Library, Hagley Museum Library, and in various individual personal libraries.

Documentation of the historical and technical sources used in the preparation of Red Clay Valley Rails was done as material was collected and initial drafts were composed. Draft copies of the text had the informational sources listed as comments for later reference purposes. As research work progressed on the text, duplication of information from multiple sources occurred. Many topics discussed in this booklet, such as Brandywine Springs or the Baltimore & Ohio Railroad, have such a volume of previously published materials, that documentation of all reference sources using footnotes would make the text difficult to read. Due to the generic nature of this booklet and in lieu of long footnote listings at the end of nearly every paragraph, the author has elected to list all reference sources for this booklet below.

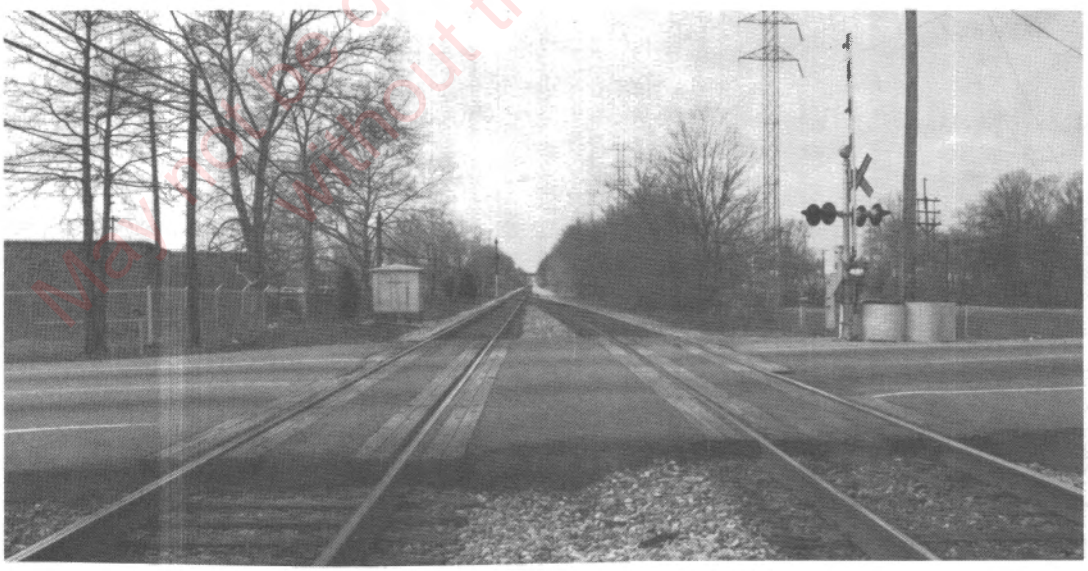
As research progressed and duplicate information became available, information accuracy became a concern. For example, the Garrett Snuff Mills have had many books and articles written about the family and the business. In addition many of the individuals the author talked to had personal information about the Garretts or the snuff mills that had been acquired over the years from various family and/or written sources.

There are any number of reasons why details and information about the same subject can differ between multiple sources. For example, there were a number of "John Garretts" including a John Garrett, Jr. and a John Garrett, II. Some information sources lost sight of which one of the John Garretts (II, III, or IV) was being discussed, or a source might confuse John II with his son John, Jr. To further confuse matters, information was not always consistent in other areas. For example, dates might differ by a year or two, descriptions of events differed, and some sources contained information that was obviously incorrect.

The historical and technical information contained in this document is as accurate as obtainable. Where inconsistencies existed the author attempted to do the necessary research to uncover the correct information. There is no doubt, that even after exercising the utmost diligence, inaccuracies may still exist in the published work. Both the author and Historic Red Clay Valley, Incorporated would appreciate knowing those inaccuracies that the reader finds especially when the reader can document and support their position.

The following list of reference documents is provided for the reader that wishes to obtain more information relating to the history of Delaware, New Castle County, and the Red Clay Valley. It includes all works used in the preparation of this booklet.

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LANDENBERG JUNCTION
The left tracks are the B&O (now CSX) main line tracks connecting Baltimore and Philadelphia. The right track is a siding track leading to the Landenberg Branch switch. This photo, looking towards Baltimore, shows Route 62 in the foreground. The small building to the left is a crossing signal and block control house and is marked *Landenberg Junction* on the front.

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About This Publication

Red Clay Valley Rails was computer generated with an IBM-AT computer with 4 megabytes of memory and 70 megabytes total disk space. The system included both 5.25 inch, 1.2 megabyte; and 3.5 inch, 1.44 megabyte disk drives and an EGA monitor. The operating System was DOS 4.01 and Microsoft Corporation's Microsoft Windows, Version 3.0.

The text was written using WordPerfect Corporation's word processing software, WordPerfect, Version 5.1. Initial checking of spelling, grammar, style, word usage, and punctuation were done with Que Software's RightWriter, Version 5 for MS-DOS. Text drafts were printed on either an IBM Proprinter II or a Hewlett-Packard LaserJet Series IID printer.

Maps for the publication were drawn by the author using Evolution Computing's EasyCAD 2, Version 2.67. Map fonts are either EasyCAD's Helvetica, or the TDE Group's GEOFONT or ITALLICC. The maps were transcribed from original Baltimore & Ohio Railroad valuation maps drawn in 1918. The center-fold map was plotted on 11" by 17" stock using a Hewlett-Packard 7475 six-pen plotter. All other maps were plotted as extended post-script files (EPS files).

Title logos and selected artwork was generated with the use of Micrografx Corporation's Designer, Version 3.1 and Adobe Systems' TypeAlign and Adobe Type Manager Version 2.0. Trademarks and other graphics were scanned using a Marstek 256 gray-scale hand scanner and Recogina's GO-CR software Version 1.1. Scanned images were cleaned-up using Microsoft Paintbrush, Version 3.0 and Aldus Photostyler, Version 1.1.

Red Clay Valley Rails was typeset on a 486DX computer operating under DOS 5.0. This computer offered 8 megabytes of memory and 120 megabytes of disk storage space. This system included both 5.25 inch, 1.2 megabyte; and 3.5 inch, 1.44 megabyte disk drives and an Super VGA (SVGA) monitor. The operating System was DOS 5.0 and Microsoft Corporation's Microsoft Windows, Version 3.0.

Typesetting was done by the author using Aldus Corporation's PageMaker, Version 4.0. The text font is New Century Schoolbook at 11 points. All titles and section headings are various point sizes of Old Towne No. 536. Final printing was done using a Hewlett-Packard LaserJet IID printer with a Pacific Page extended post-script cartridge.

Red Clay Valley Rails was printed by Communications Printing Company of Ogletown, Delaware. Negatives were shot on Agfa Gevaert film using a 20" by 24" Nuarc horizontal camera. Plates were prepared using a Nuarc flip-top plate maker. Presswork was accomplished on a 2-color 20" by 26" Komori offset press. Binding was done with a Baum folder and Rosback stitcher-trimmer.

Cover artwork was prepared by Mary Jane Arden of White Rhino Graphics.

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The author would like to acknowledge the following photographers and collectors who made photographs available for the publication in this text.

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Robert E. Wilhelm, Jr.

The author was born in 1952 and has lived in Mill Creek Hundred, a sub-division of New Castle County, Delaware all of his life. Attending John Dickinson High School, he was one of a handful of students involved in the restoration of a Kimball Theater Pipe Organ removed from the Boyd Theater in Philadelphia, Pennsylvania and relocated to the high school Auditorium. He received his Bachelor of Electrical Engineering degree with a minor in physics from the University of Delaware in 1974.



Upon graduation he was hired by the DuPont Company and assigned to the corporate Design and Engineering Division as an engineer designing solid state control systems for the company's film and textile fiber plants. Currently Bob works at DuPont's Glasgow Business Community in the Imaging and Medical Products Department. He is a process engineer in the Equipment and Instrument Manufacturing Division. In 1989 the United States Patent Office granted him Patent No. 4,816,730 for a control system which operates an automated sampling device.

Bob obtained his Delaware Professional Engineer's License in 1978. In the early-1980's Bob taught classes on programmable controllers (a form of industrial control computer developed in the late-1970's) at Delaware Technical and Community College. Here he saw the need for an educational text on the subject and in 1985 he published ***The Programmable Controller Handbook***, the first comprehensive text published.

A Technical Associate at the Mt. Cuba Astronomical Observatory, Bob enjoys astronomy, photography, music, and writing in addition to railroading and local history. He served for a number of years as a board member for the Dickinson Theatre Organ Society. Bob currently serves as a board member for Historic Red Clay Valley, Incorporated and is the organization's Director of Administration. He maintains a Fireman's rating on enginecrew and a Brakeman's rating on traincrew. He is an active contributer to ***The Lantern***, Historic Red Clay Valley's newsletter.

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Red Clay Valley Rails takes the reader on a trip up the Red Clay Valley on the rails of the original Wilmington & Western Rail Road to explore the history and industrial heritage of the region. Using nearly three dozen photos and eighteen maps, ***Red Clay Valley Rails*** looks at over fifty sites on the creek between Marshallton and Hockessin.

Red Clay Valley Rails is a fascinating text that provides information on such topics as:

The rolling mills at Marshallton were one of the few early mills in the country that produced galvanized iron.

Mt. Cuba is not the highest point in Delaware.

Kirkwood Highway is named after a gallant Revolutionary War officer by the name of Colonel Robert Kirkwood.

The Wilmington & Western Rail Road was responsible for naming the Delaware communities of Faulkland, Wooddale, Yorklyn, and Southwood.

Brandywine Springs was a famous resort in the early 1800's and later became a famous amusement park in the late 1800's and early 1900's.

Mt. Cuba was the legendary headquarters of the infamous highwayman, Sandy Flash.

The Marshall Brothers Mill, in Yorklyn, was the first to continuously manufacture vulcanized fiber in the country.

The Evans' Mill at Faulkland is often considered the prototype for Industrial Automation.

The Fells Spice Mills at Faulkland were world renown for the grinding of spices.

The Wooddale and Ashland covered bridges are the only covered bridges remaining in the state.

The Delaware Rolling Mills manufactured the shovels used to hand-dig the Chesapeake and Delaware Canal in the late 1920's.

Mt. Cuba was originally known as Cuba Rock and is believed to be where the first Catholic services in Delaware were conducted.

In 1900 the Garrett Snuff Mills manufactured 3.5 million pounds of snuff which was one-quarter of the world's supply.

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A Historic Red Clay Valley, Incorporated publication

Historic Red Clay Valley, Incorporated is dedicated to preserving the historical, cultural, and industrial heritage of the Red Clay Valley