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NAVIGATION OF THE

UPPER DELAWARE

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J. A. ANDERSON



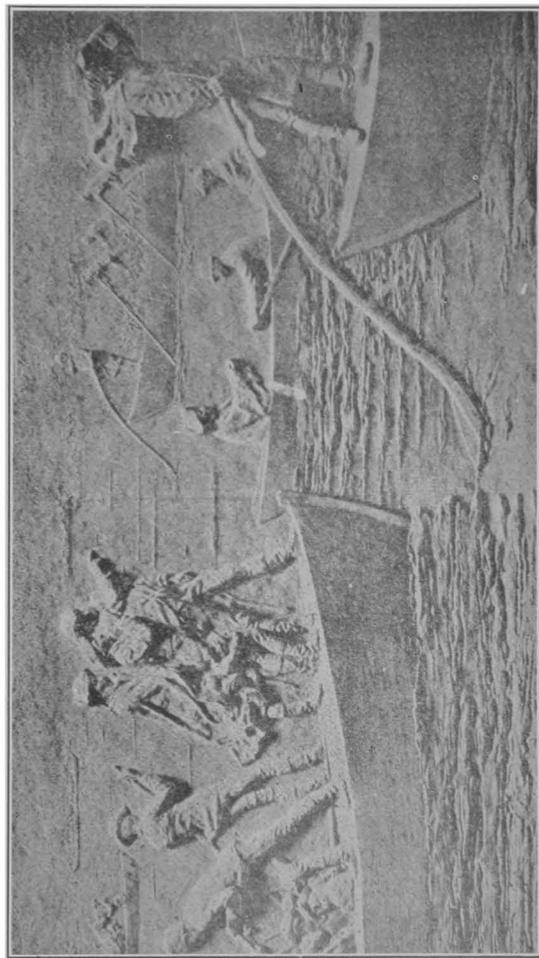
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THE CONTINENTAL ARMY CROSSING THE DELAWARE AT MCKONKEY'S FERRY, DECEMBER 25TH, 1776.  
From Tablet on Trenton Battle Monument.

NAVIGATION  
OF THE  
UPPER DELAWARE

*J. A. Anderson*  
BY  
J. A. ANDERSON  
" "  
Of Lambertville, N. J.

READ BEFORE  
THE BUCKS COUNTY HISTORICAL SOCIETY  
At Doylestown, Pennsylvania  
January 16th, 1912

*The Congressional Library*  
*J. A. Anderson*  
*Oct. 7<sup>th</sup> 1913*

TRENTON, N. J.  
MacCrellish & Quigley, Printers, Opposite Post Office.

1913

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Author  
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OCT 9 1918

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# Navigation of the Upper Delaware.

BY J. A. ANDERSON.

The history of civilization is largely found in the story of the streams. There are few great centres of population which are not in the vicinity of considerable streams or other bodies of water.

Along the water courses industrial expansion finds its way. In war and in the peaceful arts they have always been powerful factors.

As a barrier to progress or as a means of easy transit, each has its tale of adventure and of growth.

The Delaware is no exception to this. Although, in extent of flow, it is not classed with the great rivers of the earth, it has made its mark in the history of our land.

By means of this river Penn and his predecessors found access to the new homes sought, for the founders of a State, and the stream became the boundary between prosperous commonwealths.

Washington, with his little army, followed across the Jerseys by a powerful foe, found security only when he had placed between him and his pursuers the river which, in a short time, afforded the means of approach in his successful attack upon the same enemy's forces at Trenton.

The early navigators, entering the Delaware, found a broad bay, into which flowed the water from a thousand distant hills, forming a noble stream with a tidal flow easily navigable for more than a hundred miles, to the rocky rapids now known as "Trenton Falls," from their proximity to the Capital City of New Jersey.

A pamphlet published in London in 1648 refers to these rapids as the "Falls of Charles River, as the Delaware was then called in honor of King Charles," and describes them as being "near two hundred miles from the ocean."

With the change of name of the river these rapids became known as "The Falls of the Delaware," a name now superseded

by the present designation. With their rocky channel and a fall of ten feet in a distance of thirty-five hundred, they are a formidable impediment to navigation and constitute the natural division between the tidal river and the "Upper Delaware."

Above Trenton Falls is found, along the river, a succession of rapids, of which perhaps the most formidable is Wells' Falls, sixteen miles farther up, where, in a distance of nearly five thousand feet, there is a descent of twelve feet, the most of this being in the upper part, through a tangle of rocky masses which have often brought disaster to those attempting the passage.

These "Falls" get their name from John Wells, who, at an early day, held the ferry right, half a mile above, on the Pennsylvania shore, where the borough of New Hope is now situated.

With the rifts and rapids of a more or less difficult character, and intervening stretches of more quiet water, there is a descent of one hundred and sixty feet in the forty-nine miles between Trenton and the "Forks of the Delaware," by which title the early comers designated the point where the Lehigh enters at Easton, Pa.

Above Easton there are also a number of places where navigation is attended with much risk. Of these, perhaps, the most noted is "Foul Rift," about three miles below Belvidere, N. J.

Various have been the means of transport on this stream. Mention is found of the Indian canoe and of other small boats used by the early white settlers here, but, for a long period, we hear of no navigation worthy of the name. The current rolled by unused until necessity led to methods of transfer of commodities between the different localities on the river, and especially to and from the principal market, the City of Philadelphia.

The chief means of such transfer was found in the raft, the coal ark and the Durham boat, of which only the last could be used for returning to the starting point with goods exchanged for the cargoes carried down the stream.

Demands on the lower river, for the lumber of the forests at "Head Waters," brought naturally into use, as on other streams, the easy transport by the raft.

In his "History of Bucks County" Gen. W. W. H. Davis records that the first raft to navigate the Delaware started from Cocheton, some forty miles or more above Port Jervis, in 1746, under the management of one Skinner, aided by a man named Parks. The hazardous run of nearly two hundred miles brought the adventurers to Philadelphia. Here, we are told, the two men were given "the freedom of the city," of which they doubtless made good use, and that Skinner was created (by what

authority it is not stated) "Lord High Admiral of the Delaware," a title which he is said to have borne until his death in 1813.

Davis further states that this raft consisted of six pine trees, or logs, seventy feet in length, to be used as masts of ships then building in Philadelphia. Holes were made through the ends of the logs and all were strung together on poles, called spindles, with a pin at each end to keep the logs from spreading apart. This proved to be the beginning of an enormous business, to supply an ever-increasing demand.

The woodman, with his axe, invaded the forests of the upper streams. When the winter cutting was over and the rafts were prepared for the voyage, the lumberman floated away with them on the rising waters, swelled by melting snows.

For weeks together, during the rafting season, there was seldom a day in which, at almost any time and place, a number of rafts might not be seen floating lazily by, with, now and then, a gentle touch of the long oars, swung on pins on front and rear, to keep the rafts in the proper channel, or with alert and vigorous work, on nearing points where projecting or hidden rocks threatened disaster.

It was the business of those who were engaged in "running the river" to be familiar with all the difficulties to be encountered, and to many of the rocks the watermen gave names, which were usually derived from some relation to the current or other features of the navigation.

At Easton, in boating times, the "Forty Barrel" rock and the "Sixty Barrel" rock each indicated, when covered by water, the number of barrels of whiskey that a Durham boat might then safely carry.

The most comprehensive list that has come to the knowledge of the writer is that comprising the rocks in and near Wells' Falls, which were considered the most dangerous rapids on the river.

At the head of these rapids, the "Entering" rock often caused disaster to the unwary or unskilful navigator. If the "Hundred Barrel" rock, a little farther on, were covered with water, a Durham boat carrying a hundred barrels of flour might pass through the channel safely.

The only rock in the Falls which, at all times, had grass growing on it, was known as the "Grass" rock. Another, the "Foamer," gets its name from the foam produced by it at low water, when the passage is dangerous. Below the "Foamer,"

at the foot of the swift water, upward bound boats stopped at the "Dram" rock for a rest for the men and an invigorator from the whiskey jug, which always found a place on board. Very appropriately this rock has a gravel worn cavity which somewhat resembles a punch bowl.

On the New Jersey side of the channel and below the "Dram" rock are "Rodman's" rocks, where a raft, conducted by a Captain Rodman, was wrecked and Rodman was drowned. Farther down and only seen at low water is the "Bake Iron." This is flat and rounded and lies near a ledge known as "Buckwheat Ledge." The origin of this name is unknown, but the writer's informant states that when fishing near the place he has seen floating about the ledge hulls of buckwheat, at the time when this grain was being ground by the mills on the river.

Below the last named is "Fish" rock, over which falls a cascade producing an eddy which is likely to draw under the fall any small boat approaching in the unskilled hands of a would-be fisherman.

A short distance above the "Enterin" rock (so termed by the watermen) an iron ring in a rock gives it the name of "Ring" rock, and a little farther up is "Corneel's" rock, so named from the habit of fishing there of one Cornelius Coryell, an old-time resident of the vicinity.

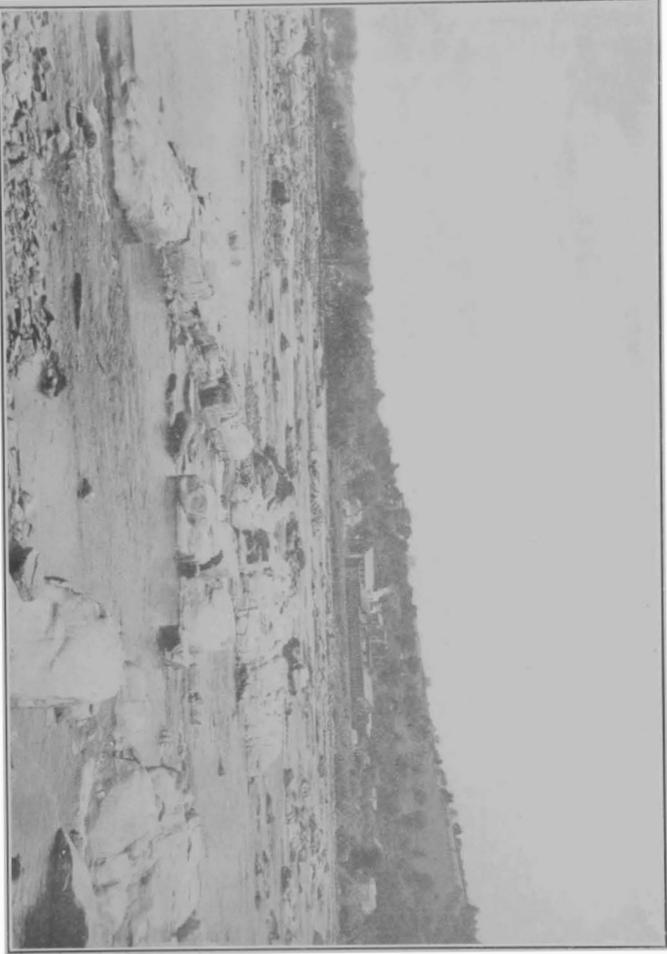
The rocky character of the river bed, at Wells' Falls, is shown in one of the illustrations, from a photograph taken at low water.

During the busy season the rafts would run in "strings," following each other closely, and, if one were stopped by rock or shoal, the next would sometimes attempt to get it off by striking it. If the attempt failed or if the way were seriously obstructed by the stoppage of the first raft, the next would often be brought to a stand. The writer has often seen a number thus stranded, at one time, in Wells' Falls.

No record is at hand of the quantity of lumber floated down the Delaware, but partial data, and the recollection of many persons still living, show that the amount was very great.

Hazard's "Register of Pennsylvania" states that it was estimated that, in the Spring of 1828, as many as a thousand rafts, containing fifty million feet of lumber, descended the Delaware during the rafting season.

In a manuscript read before the Bucks County Historical Society by Mr. B. F. Fackenthal, Jr., and printed in the records



WELLS FALLS AT LOW WATER.



of the Society, Vol. 3, page 530, is found the following statement:

"In a manuscript found among my father's papers, the late B. F. Fackenthal, Esq., of Easton, Pa. (born 1825, died 1892), he says that rafting on the Delaware was at its height in 1840 to 1845 and that it began to decrease in 1855. The season was generally about four weeks long, during the Spring freshets. For the first two weeks nearly all the rafts were of sawed lumber, and during the last two weeks they were mostly of logs. During the middle, or height, of the rafting season he frequently stood on an elevation back of his residence, in Durham township, and could count often as high as fourteen, and occasionally as high as twenty, rafts in sight at one time. Rafts now on the Delaware are a rare sight. I saw one during the Spring of 1907, and am told that there were several others that season."

These statements accord entirely with the observations of the writer, whose knowledge of the river dates from 1843. A statement has been met with that there were a good many log rafts on the river in 1903. One observer mentions that in 1908 or 1909 he saw two log rafts passing Lambertville, but with the exhaustion of the forests and the opening of other transportation channels, for what the lumberman might still glean, the raftsman has practically lost his calling.

The life of the raftsman was one of hard work and exposure, and required hardy men. As a rule, the raft carried no shelter from sun and storm. The need to be constantly on the alert would have forbidden its use, the frequent rifts and rapids calling for constant watchfulness.

Night, necessarily, brought rest at one of the numerous stopping places which grew up under the stimulus of the traffic. Of these, on the lower part of the river, were "Upper Black's Eddy," a short distance above Milford, N. J.; "Lower Black's Eddy," near Point Pleasant, Pa.; the "Old Red Tavern," at Lambertville, N. J.; "Mershon's," at the foot of Wells' Falls, and another "Red Tavern," near Trenton. At these and many others convenient landings, rest and refreshment were to be found.

The trip ended, the raftsman threw his pack over his shoulder and tramped his way homeward or used the railroads when available.

The men who started with the rafts did not always complete the trip. Some were not acquainted with the lower river, and, at some point, turned the task over to others. Often rafts were

laid up at some way point for a considerable time, awaiting sale, and the men who came with them would return. Favorite places for tying up were the two "Black's Eddies." Here, at times, the accumulation was such that, for long distances, the collection of rafts extended nearly across the river. At New Hope they would sometimes extend for half a mile or more along the river bank, two or three deep.

Men living along the river made a business of running these delayed rafts to destination or of piloting rafts through difficult places. Five dollars was the usual fee paid the pilot for conducting a raft through Wells' Falls.

Many interesting reminiscences of the rafting days are presented in a paper on "Old Time Lumbering on the Delaware," contributed recently to the Bucks County Historical Society, by Mr. Thaddeus S. Kenderdine.

Somewhat akin to the moving of lumber by the raft was the plan adopted for carrying anthracite coal to market in the earlier days of its production.

A long period elapsed, after the discovery of coal, before its usefulness was demonstrated and a demand for it at Philadelphia and other distant points made necessary some more efficient means of reaching a market than carrying small quantities overland.

Until canals were provided, the rivers Lehigh and Delaware formed the natural channel for the movement of coal from the Lehigh region, and any account of navigation on the Delaware must necessarily include what was done on the tributary river, which supplied so large a part of the traffic.

The difficulties of navigation were much greater on the Lehigh than on the Delaware, and accounts of the labor and ingenuity expended in overcoming them, form an interesting chapter in the annals of those early times.

The vessel first used for water transportation of the coal was known as the "Ark." This, on the Lehigh, was, at first, a rectangular box, made of heavy planks spiked together. The tightening of the joints by the swelling of the wood was evidently relied upon for adequate flotation, although mention is found of securing added buoyancy by some lumber placed in the bottom, and also of a double bottom, from which leakage could be conveniently pumped out.

At first these arks were forwarded singly, but, later, advantage was found in hinging a number together, thus forming a long, flexible craft, which passed readily over uneven currents, guided

in the same manner as the raft, by oars on the ends. The ark at each end was sometimes somewhat pointed to facilitate the movement. An ark run singly was also sometimes pointed on the ends.

The plan of hinging several of the boats together required a less number of men than was needed when each had a separate crew. A similar method is seen in the canal boat of two boxes hinged together, which may be separated for convenience in loading and unloading.

The lumber of the ark was sold at destination, the iron-work being carted back for further use.

Mr. M. S. Henry, in his "History of the Lehigh Valley," published in 1860, gives the following account of these vessels:

"The boats used on this descending navigation (on the Lehigh) consisted of square boxes, or arks, from sixteen to eighteen feet wide and twenty to twenty-five feet long. At first two of these were joined together by hinges, to allow them to bend up and down in passing the dams and sluices, and, as the men became accustomed to the work, and the channels were straightened and improved, the number of sections in each boat was increased, till, at last, their whole length reached one hundred and eighty feet. They were steered with long oars, like a raft.

"Machinery was devised for jointing and putting together the planks of which these boats were made, and the hands became so expert that five men could put one of the sections together and launch it in forty-five minutes. Boats of this description were used on the Lehigh until the end of the year 1831, when the Delaware Division of the Pennsylvania canal was partly finished."

Other accounts of transporting coal on the Lehigh, by arks, also indicate that but a single box was used at first, and an experienced waterman, whose father was engaged in running arks, has told the writer that in the "string" afterwards adopted, the front and rear boxes were pointed.

A drawing of a single ark, in a publication by the "Wyoming Historical and Geological Society," shows both ends pointed and a small cabin perched on a floor above the cargo.

In "Watson's Annals of Philadelphia" is found the following brief mention of the practice in ark building on the Lehigh:

"The boat building is a curiosity. Here four men make a coal ark for twenty-five tons in thirty minutes. They plane the joints of the pine boards with a plane of nine irons, turned,

to give it power, by a crank. Twenty spikes, of six inches length, are driven home, at a single stroke, one at a time."

In Davis' "History of Bucks County" it is stated that "William Trumbull built the first ark at Mauch Chunk in 1806, and she made her first trip to Philadelphia that year with 300 bushels of hard coal."

Davis further states that "Jacob Van Norman started from Mauch Chunk August 9th, 1814, with an ark loaded with two or three hundred bushels of coal. After many vicissitudes in going down the Lehigh, among which was staving a hole in the bottom, into which the men stuffed their clothing, she reached the Delaware and floated safely down to tide water."

Henry mentions the dispatch of several arks in 1813, part of which reached Philadelphia, and one in 1814, which was 14 feet wide and 65 feet long, carrying 24 tons of coal, and which met with many difficulties by the way, but finally reached its destination.

The passage through a difficult rapid, by this singular namesake of Noah's vessel, must have been interesting and exciting.

For the material needed in building the arks, the Lehigh Company secured a timber tract at Lowreytown, seventeen miles above Mauch Chunk, where arks and also rafts were constructed. It is related that sometimes pleasure parties of ladies and gentlemen would ride down to Mauch Chunk on the rafts, seated in boxes for protection from the waves in the rough waters encountered on the way.

The consumption of lumber in the arks became so enormous that efforts were made to transport the coal to Philadelphia by boats which could be returned. These efforts, referred to more particularly elsewhere in this paper, were but partly successful. They appear to have been conducted during the interval of about three years between the completion of the slack water navigation on the Lehigh, in 1829, and the opening of the Delaware Division of the Pennsylvania canal, from Bristol to Easton.

Owing to the difficulties encountered, especially on the Lehigh, the loss of an ark was a not unusual occurrence, and improvements in the passage, at some of the dangerous places, were made by the companies interested. At some points on the Delaware, also, considerable expenditures were made by the corporations and the neighboring States.

To facilitate the passage of the difficult places on the Lehigh, as well as to supply a sufficient flow, at times of low water, resort was had to what has been termed "Artificial Freshets". A rough

dam was constructed with an opening having a gate of peculiar character, which, when closed, caused the water to accumulate. At the proper moment the gate was removed and the arks and other craft in waiting were carried through by the rushing water, to the level below.

This plan proved very effective for a limited business, but was eventually superseded by the better methods required for the rapidly increasing traffic.

In an extended notice, in Henry's work, of Josiah White, one of the pioneers and engineers of the early coal operations, the following appears:

"Messrs. Hazard and White were their own engineers. They waded in the stream; they sounded the channels; they took the levels of the rapids; they directed the blasting of the rocks, the building of the wing dams, and the removal of the bars. But something more was needed to make a good descending navigation, and this was effected by a system of flushing called 'Artificial Freshets'. These artificial freshets were produced at stated intervals, and generally during the season of navigation, by storing water in the pools of dams built across the river, of log crib work filled with stone. Wide sluices for passing rafts and coal arks were made in these dams, and they were readily opened and shut by one man, by means of hydrostatic pressure, acting on a contrivance of Josiah White, known by the name of the 'Bear Trap Lock.' The arrangement was very simple and ingenious and fully answered the purpose.

"By means of this descending navigation, the Lehigh trade was started in 1820, two years in advance of that on the Schuylkill Navigation, and the coal continued to be carried in arks until after the Lehigh canal was constructed and ready for use."

The use of artificial freshets on the Lehigh is understood to have been the only application of this method, of anything like a permanent character, in this country. A somewhat similar plan has been used on many rivers for the flotation of lumber from shoal upper waters, and Henry mentions the well known instance of its employment by General James Clinton, in moving his forces from Otsego lake into the Susquehanna, on his way to join General Sullivan in his operations, in 1779, against the Indians who had been concerned in the Wyoming massacre. Here an easily removed dam was placed at the outlet of the lake, and taken away when the water had risen sufficiently, allowing the waiting boats to float down with the released waters.

General Clinton's operation is fully described in the introduction to an early edition of Cooper's "Pioneers" and in the

appendix to his "Deerslayer" of the same edition, as well as in historical works relating to the Sullivan expedition.

In the "Deerslayer" the name ark is applied to the floating habitation of one of the characters of the tale, and, in the appendix, is given some account of the craft so designated, as used on the Susquehanna, for carrying wheat and other products.

The ark was also used on the Ohio and the Mississippi, and doubtless on other rivers, but no mention has been found of its use on the Delaware except in the coal traffic from the Lehigh. The demand on the latter river for improved methods and the consequent inauguration of canal navigation, brought about radical changes, and the crude and clumsy vessel, having, like its great prototype, fulfilled its mission, vanished from the scene.

As before stated, a short time before the canal along the Delaware came into use, efforts were made to provide boats which might descend and return by the river. In "Hazard's Register" mention is made under date of November 7th, 1829, of an iron boat built by the Lehigh Coal and Navigation Company, which is said to have made her first voyage from Mauch Chunk to Trenton and back to Easton up the channel of the Delaware, to complete satisfaction. Experiment was also made with a boat built of wood, which Hazard also mentions, but he adds "The experiment made with the iron boat, however, is decisive as to the value of the channel and there need be no suffering the coming winter, along the Delaware, for want of coal, as the Durham boats can, by having a constant business, carry down coal to good advantage and the larger boats, such as tried by the Company, to still greater advantage."

No record has been found of the further use of this style of boat for ascending the Delaware. That large boats could be successfully taken down the river is shown by the fact that, at a later period, this was done at times with the "Red Line" boats which ran on the Pennsylvania canal, but these could not be returned by the river.

Several attempts have been made to provide for navigating the Delaware by other means than simple flotation and manual power. Davis speaks of an invention having this object in view, which was tried in 1824, which he describes as follows:

"It was intended for a tow boat and was propelled by the action of the water on a number of buckets attached to a wheel on each side of the barge. It drew a Durham boat and a large ark containing sixteen persons up through the rapids at Trenton,





WELLS FALLS AT HIGH WATER.

at the rate of one and one-third miles an hour, and it was supposed it could make three miles an hour with the machinery properly adjusted." Nothing further appears to have been heard of the invention.

A paper read by Rev. D. K. Turner, before the Historical Society of Bucks County, Pa., describes the early experiments in that county, by John Fitch, in connection with his efforts to perfect navigation by steam power. The paper states that "Lewis Rue and John Shaffer gave a certificate that they set out from Philadelphia, June 5th, 1790, at four o'clock in the morning, and went in the steamboat to Trenton and thence to Lambertville, and back to the city in the afternoon, at a speed of  $7\frac{1}{2}$  miles an hour."

Considering the extreme difficulty of passing Wells' Falls, which are below Lambertville, especially with this imperfect craft, even if the swift channel understood to have existed inside of Malta Island were then available, it would seem as though there were some error here as to the upper terminus of the trip. In addition to the difficulties of the ascent, the writer, who has known the place for more than three-score years, and whose relatives resided there at the time of the alleged occurrence, has never heard any mention there of the event, which could not have failed to produce an impression which would have long remained. That the boat may have proceeded as far as the foot of the falls below Lambertville is the more likely supposition.

In later days several attempts were made to introduce steam navigation on the river above tide. The Belvidere Delaware Railroad was opened from Trenton to Lambertville, February 6th, 1851. In the following year the "Major William C. Barnet," a sternwheel steamer, for some time made regular trips between Lambertville and Easton, in connection with the trains. The frequent rocky rapids and the changes in height of water interposed difficulties which led to the exchange of the Barnet for a smaller boat, the "Reindeer," which, however, ran but a short time.

Henry states, in his "History of the Lehigh Valley," that previous to the advent of the Barnet, several unsuccessful attempts were made to navigate the upper Delaware by steam. The present writer has found no other mention of these.

Respecting the Barnet, the following items are taken from the diary of the writer. On July 22d, 1851, he started from Vine Street wharf, Philadelphia, on the steamer "Major William

C. Barnet," Captain Young, for Lambertville. Stuck in Trenton falls and returned to Trenton to wait for higher water. Here the writer left the boat. There was great excitement at Lambertville and New Hope and much disappointment with the assembled crowds, at the non-arrival of the long expected steamer.

On November 17th the Barnet ascended the river as far as Yardleyville and on the 19th as far as Scudder's Falls, where she broke some paddles and returned to Trenton. Her first arrival at Lambertville was on November 24th, about 6 P. M., amid the shouts of the people and the firing of cannon.

On the 26th a trip to Easton was attempted, but, failing to pass Howell's Falls, a short distance above Centre Bridge, the boat returned to Lambertville and went into winter quarters.

On March 11th, 1852, the Barnet made an excursion from Lambertville to lower Black's Eddy and return, with one hundred and fifty persons. On the next day the regular trips to Easton began, the run to that point occupying eleven hours. On April 19th the steamer brought from Easton one hundred and twenty persons to take the train at Lambertville for the Kossuth reception at Trenton.

No note is found of the discontinuance of the trips of the Barnet, but there is mention of the first trip of the "Reindeer" from Lambertville to Easton, on April 28th, 1852. She ran up the canal feeder and entered the river at Bull's Island.

In 1860 a steamboat, the "Alfred Thomas," was built at Easton for some parties at Belvidere, who designed running the boat between the latter place and Port Jervis. On the first attempt to ascend the rapids a short distance above Easton the boiler exploded, causing much injury and loss of life to those on board, and the partial destruction of the boat. The experiment was not renewed. There have been no further attempts at steam navigation on the river above tide.

An account of the river transportation should include some reference to the ferries, which afforded means of transferring persons and property across the stream before the construction of bridges.

Unfortunately the history of the ferries is, in a great measure, lost. They, as the necessities required, became very numerous, one being found every three or four miles, until superseded by the bridges.

The ferry was usually known by the name of the person who operated it, and as the ownership frequently changed, it is often difficult for the student of local history to determine the

location of a ferry mentioned. A further complication arises from the fact that the right of operation from opposite sides of the river was not always held by the same person.

Thus, we find, that in the year 1733, John Wells held the ferry right at the present site of New Hope, on the Pennsylvania shore, while one Coates held it on the New Jersey side, where Lambertville now is.

Thus Wells and Coates were operators on opposite sides, at the same part of the river. In the year last named, His Majesty King George the Second granted the ferry right on the New Jersey side to Emanuel Coryell, whose name the ferry on that side bore until the establishment, in 1812, of a post office, to which was given the name of Lambertsville, since changed to Lambertville.

The two shores came under one designation when, some years after the advent of Emanuel Coryell, his son John bought the ferry right on the Pennsylvania side and the name "Coryell's Ferry" was applied for a time to both sides of the stream.

As such the locality became known as the scene of important movements in the Revolutionary struggle and, with McKonkey's Ferry, where the ever memorable "Crossing" occurred, holds a permanent place in the annals of those stirring times.

Washington and the patriot forces were several times at "Coryell's" and the General's "Headquarters" still stands in Lambertville, not far from where the ferry boats landed.

Much of interest would be found in the recital of the history of other ferries on the river, if it could be brought to light.

The early ferry boat was the canoe, either that of the Indian or fashioned somewhat like it. By this the traveler, with his saddle bags, was conveyed across the stream while his beast swam behind.

With the opening of roads and the advent of wheeled vehicles came the ferry with its commodious "Flat." This was a long, narrow boat, with flat bottom and vertical sides. The bottom sloped upward at the ends, to the height of the sides, which were parallel and about a foot high. At each end was a flap or "apron," so hinged as to be turned in-board while crossing and outward at the landing, to make connection with the shore, forming a short bridge for the passage of teams.

The usual mode of propulsion was by means of "setting poles". The operation of the ferries was often difficult and hazardous. Floating ice and high water interfered seriously with the passage. A disaster, in which there was loss of life and property,

occurred at Lambertville, in an attempt to cross, during high water, in the interval between the partial destruction of the bridge by the freshet of 1841, and its restoration.

At some ferries, where the river was narrow, the movements of the ferry boat were controlled by ropes attached to pulleys running on a rope or wire, stretched across and usually overhead. By means of the ropes the boat was placed diagonally to the current and carried across by its force. The method is understood to be still in use at some points on the upper part of the river. It is the plan adopted for the canal boats crossing between the outlets below Lambertville and New Hope, where a heavy wire rope carries the pulleys.

We now come to a particular consideration of the most important and interesting feature of the transportation methods of the Upper Delaware.

This is found in the craft known as the "Durham Boat," which, until the canals came into use, was the sole means of moving commodities in both directions on the river between Philadelphia and points above tide.

This boat was well known on the Delaware for more than a century, for, even after the building of the canals, it was used on them as well as on the river to a considerable extent.

The local histories give little precise information respecting the form and the method of operation of this important means of transporting the commerce of the upper river. To the writer's own recollection he has been able to add much of interest gleaned from various sources. Much information was obtained from men who had known something of the boat, as well as from some who had operated it.

Of the latter, the one to whom the writer was most indebted was the late Wilson Lugar, of Lumberville, Pa., who, at the age of seventy-eight years, retained a remarkable recollection of details of the construction and operation of these boats.

In his "History of Bucks County" General Davis states that the last trip of a Durham boat to Philadelphia was made by Isaac Van Norman, in March, 1860. Mr. Lugar stated that he, himself, made the last trip to that city, with a Durham boat, in 1865, with a load of shuttle blocks, and that the boat used on that trip was the last used on the river.

It is frequently stated that the Durham boat was modelled after the Indian canoe. Both were pointed at both ends, but, in other respects, there were marked differences. In fact the name "canoe" has been applied to a variety of dissimilar craft.

In section the sides of the Durham boat were vertical, for the most part, with slight curvature to meet a like curvature of a part of the bottom, which, for the most of its width, was flat.

Lengthwise, the sides were straight and parallel until they began to curve to the stem and stern posts, at some twelve or fourteen feet from the ends, where the decks, fore and aft, began, the rest of the boat being open.

The partly rounded form of the hull was preserved at the ends, instead of being hollowed, as was usual in the Indian canoe. Perhaps the craft most like the Durham boat, in general shape, would have been the "dug-out," a log hollowed out and pointed at both ends, with the bottom and sides slightly flattened.

The ordinary length was sixty feet, although shorter boats were built, and, in some instances, the length was extended to even sixty-six feet, with sometimes a foot or two added to the ordinary width of eight feet. In other localities where the Durham boat was introduced some variations in dimensions were made to suit the local conditions.

The usual depth, from top of gunwale to the twelve-inch keel plank, was forty-two inches, with additional height at the ends of some ten inches, this and other minor features depending upon the fancy of the builder. The draft, light, was from three and a half to five inches, and loaded about twenty-eight inches.

The boat sixty feet long would carry, down stream, one hundred and fifty barrels of flour or about six hundred bushels of shelled corn. Some of the largest boats built would carry twenty tons, although the load for the ordinary boat was from two to five tons less. The load, up stream, was about two tons.

On the Delaware the crew usually consisted of three men. On some of the more difficult streams more were needed.

The movement down stream was by floating with the current, with the aid, when necessary, of a pair of eighteen foot oars. Moving up stream the boat was usually propelled by "setting poles," twelve to eighteen feet long and shod with iron. On the thwarts was laid, on each side, a plank twelve inches wide. On these "walking boards" members of the crew, starting at the forward end, with poles on the river bottom and top ends to shoulders, walked to the stern, pushing the boat forward. While they rapidly returned to repeat the process, the captain, who steered, used a pole to hold the boat from going back with the current or, when necessary, pushed it forward by "setting" with a pole, in the short distance which the length of the stern deck permitted.

For the better footing of the captain in this process, as well as for drainage, the stern deck had a slight incline backward. The forward deck was even with the gunwale and the surface was slightly rounded, so as to shed the water.

The steering oar was thirty-three feet long, with a blade twelve inches in width, of the form shown in the plan. It is possible that the shape of the oar may have been slightly varied, according to the necessities of builders.

A "keel plank," twelve inches wide, was a part of the hull, there being no keel. The boat, as a rule, was painted black and was without special name.

A movable mast, six inches in diameter and thirty-three feet long, with a boom of the same length and a three-cornered sail, enabled the boat to sail up stream when the wind favored. Being without keel or centre board, it could only sail with the wind astern, but, with a favorable wind, the progress was very rapid.

Sometimes the nature of the banks admitted of drawing the boat along by catching hold of the overhanging bushes, a process known as "pulling brush." In Foul Rift, a particularly difficult rapid, the remains are still seen of iron bolts, in the rocky face on one side of the river, to which rings were attached, by means of which boats were drawn up by boat hook or rope.

In descending some of the rapids the "walking boards" were set up on edge as "splash boards," to keep out the water which would dash over the sides. To admit of bailing out any water which might gain access to the hull, "bailing places" were provided at the ends of the decks. Water falling on the stern deck was carried below by a drain pipe.

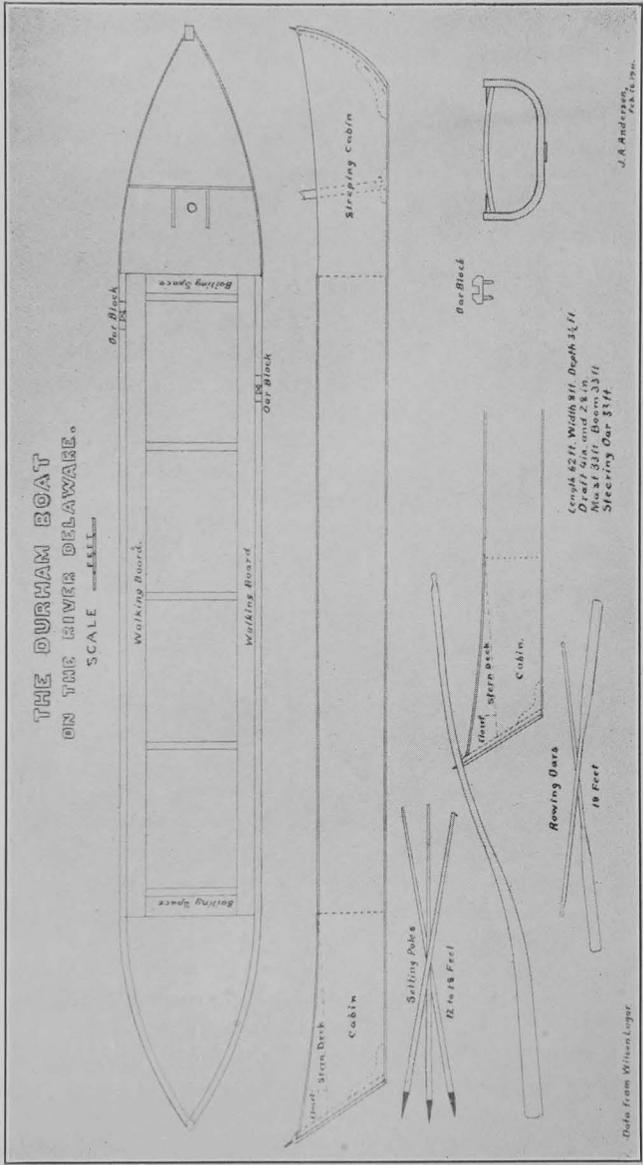
The furniture was of the most limited character. A large iron pot, with a side hole near the bottom for draught, served as cook stove, with pieces of flat iron to hold the pan. There was a coffee pot and a water bucket and, for each member of the crew, a tin cup and plate and a knife and fork and, for all, the unfailing gallon jug of whiskey, from which, an old boatman stated, drinks were taken only at certain places. The men slept on "barn feathers" or straw in the forward cabin, when the weather did not admit of sleeping in the open.

Mr. Lugar, from whom these particulars were learned, wrote, "The Durham boat was the most beautiful modelled boat I ever saw. Her lines were perfect and beautiful. Her movement through the water was so easy, with such a clean run aft, that she left the water almost as calm as she found it. It appears they never could improve on the model of the original boat, as



**THE DURHAM BOAT  
ON THE RIVER DELAWARE.**

SCALE 



Length 62 ft. Width 9 ft. Depth 3 1/2 ft.  
Depth 6 in. and 2 1/2 in.  
Depth 3 1/2 ft.  
Starboard Cabin 3 1/2 ft.  
Port Cabin 3 1/2 ft.

Draft from Wilson Cooper

J. A. Anderson, P. S. N. P. Co.

it was so perfect as far as light running was concerned. They could outsail any boat I ever saw sail, with a fair wind.

"Of course they could not work to windward, as they were too long and had no centre board. We could sail up any falls on this river. It took two men to steer them sailing up those awful currents, such as Wells' Falls, Foul Rift, Cape Bush, Rocky Falls, Eagle Island, and many others."

In the accompanying reproduction of a drawing made by the writer the form and dimensions shown are as indicated in a sketch by Mr. Lugar and confirmed by him, on inspection of the drawing. He was a skilled mechanic and possessed an excellent eye and memory for such details, and was very familiar with these boats, one of which he had owned and operated.

Mr. Lugar stated that in some details there were slight variations made by different builders. Some made the ends higher than indicated in the plan and the lengths varied from the usual sixty feet to as much as sixty-six, and, in the longer boats, there was sometimes the addition of a foot or two to the ordinary width of eight feet.

Some observers recall seeing a much shorter length than sixty feet and boats having both ends precisely alike in curvature and sometimes not quite as sharp as indicated in the plan. Different statements have also been met with as to the exact curvature of the hull in cross-section.

In all essential particulars, however, the type was preserved, and, as Mr. Lugar pointed out, it was most admirably fitted for the service on the Delaware in which it was employed.

It is said that at one time there were several hundreds of these boats on the river. The largest fleet was at Easton, from which place were shipped large quantities of grain, whiskey and other products. At Coryell's Ferry and Wells' Ferry, now Lambertville and New Hope, a large number of boats were owned, these points being centres for a considerable population producing materials for transportation to Philadelphia. Many were owned at other points on the river.

A newspaper article relating to some conditions at Lambertville in 1796 states that at that time there were but few houses in the place and that the only means of transportation was a Durham boat which made a monthly trip between the place and Philadelphia.

A man now living informs the writer that he has seen as many as a hundred Durham boats laid up, for the night, at Lambertville, on their way up the river. In some recollections of the

late John H. Horn, published a few years ago, he states that these boats would often go in fleets of as many as twenty-five, and, that in sailing in line, they made a beautiful sight.

One observer states that he has sometimes sat on the river bank and watched a number of Durham boats waiting for a favorable breeze, when a "puff" would suddenly come up and "off they would go like a flock of sheep." Going thus in fleets the crews frequently aided each other, in getting through difficult places, by "doubling up."

The life of the Durham boatman was very laborious. The descent of many of the rapids was attended with much danger, requiring constant vigilance, and the ascent of the stream was accomplished only by hard work. The crew must always be on the alert and they were subjected to severe exposure.

In the earlier days, Wells' Falls was passed by a channel, between the Pennsylvania shore and the narrow island known as Malta. By this route the rocky channel of the river was avoided. The swiftness of this interior channel was such that it gained the name of "Horse Race." The locality still bears the name of Malta although no longer an island, the inside channel having been closed by the encroachment of the Pennsylvania canal, built in 1827.

Some old documents speak of "locks" as among the appurtenances of the Prime Hope mill property on the New Jersey side by Wells' Falls, and an old gentleman, recently deceased, stated that there was a lock there through which Durham boats might pass, but the writer has been unable to learn anything definite as to its character. Mr. Lugar stated that a "gate" of some sort existed at one time at Lynn's Falls (Holland), through which boats could pass and avoid the rapids.

In connection with his inquiries respecting the Durham boat, the writer has met with some incidents, both interesting and amusing, which it may be well to relate.

In the year 1809, the Hon. John Lambert, United States Senator from New Jersey, writes to his wife, living near Lambertville, that the table fare at his Washington boarding house was "pretty fair" but that the table drink was beer, which he did not fancy and, as he did not like spirits, he wished her to send him a barrel of cider, by Pidcock's boat, to the Philadelphia Navy Yard, from which place it would be forwarded. Some further correspondence indicates that the cider went astray. Pidcock's boat was a Durham boat run by one Pidcock, between Coryell's Ferry and Philadelphia, which also figures in the



MALTA ISLAND.



following incident described in a paper by the late Martin Coryell.

In the year 1825 two young men of New Hope were moved to go to Philadelphia, one Sunday afternoon, to "see the Fourth of July" next day. The walk of some thirty odd miles during the night brought them to "Town" a little before breakfast time and pretty tired. At Watson's hotel, where they proposed stopping, the landlord was not seen when they arrived and one of them found an inner room in which to rest awhile. After a time he was aroused by a passing band, with a military company and, coming out, met the landlord and inquired of him when breakfast would be ready. The landlord accused him of being crazy and informed him that it was about supper time.

The other fellow, who was a hatter, took the opportunity to go out and buy some furs which he needed, and took them to the river to forward by Pidcock's boat, which happened to be lying at the wharf. No one being at the boat he crawled into the sleeping cabin to wait until some one should come who could take charge of the furs. He was roused some time after by the taking down of the mast in passing Trenton bridge, on the homeward trip. His amazement and that of the boatmen may be better imagined than described. Some breakfast and reflection brought resignation to the conditions, and the furs and their owner reached New Hope before night, the boat making one of the quickest trips on record, owing to a favorable wind all the way. Thus the two young men "saw the Fourth."

An account by Mr. Lugar of his trip to the Brooklyn Navy Yard is sufficiently entertaining to be quoted in full. He says, "In 1863 I took a Durham boat load of ship's knees to the Brooklyn Navy Yard and sold them to Uncle Sam. I cut them in the Blue Mountains and along the river. We lived on the boat and worked up as far as Columbia, where we loaded what we got in the mountains, and the other part we picked up as we went down the river.

"At Lambertville we went into the Feeder and from thence to New Brunswick. We were towed from Brunswick to the Brooklyn Navy Yard, and when we got there our boat was nearly full of water, but I knew she could not sink if she filled full.

"We had to report our boat to the naval officer and give her name, so as to have her entered on their list of arrivals. I told them she had no name. 'Can't you give her one?' 'Yes, we'll call her the Monitor.' 'Where do you hail from?' 'Blue Moun-

tains of Pennsylvania.' They wanted to know how I got from the Blue Mountains to New York. I told them I came across the country 'on the dew.'

"There were 7,000 men working in the navy yard at the time and they all came down to see the boat and its captain. The boat was a great curiosity and it kept me busy answering questions. They all wanted to know where I hailed from and what the boat was for and if there were any more of them. I found one man who knew what it was. He came from the Delaware. So you see a Durham boat made a trip to New York and returned."

The Durham boat played an important part in the history of our country during the Revolutionary struggle. When Washington, abandoning the line of the Hudson, and, making his way across New Jersey, was preparing to put the Delaware between his little army and the British under Howe, he wrote from New Brunswick, directing that boats be collected for his expected crossing at Trenton. He ordered that Durham boats be secured, mentioning that one could carry a regiment, a fact indicating the depleted state of the army.

Again, when preparing for the historic crossing at McKonkey's Ferry, for the attack on Trenton, these boats were brought into requisition. In "The Battles of Trenton and Princeton," by General Stryker, it is stated that the boats for crossing at McKonkey's were collected by Captains Jacob Gearhart, Daniel Bray and Thomas Jones, of the New Jersey Militia, assisted by John Clifford. Some local historians mention others as helping. The boats, with others previously collected, were stored behind the thick woods of the island of Malta, before mentioned, and at the mouth of Knowles' Creek, a short distance above the point of the projected crossing at which the men of Marblehead navigated the boats across the icy current. General Stryker states that there were about forty Durham boats on the river at the time.

In the historical painting by Emanuel Leutze of "Washington Crossing the Delaware," the boat shown bears no resemblance to the boats used at McKonkey's, the aim evidently being for artistic effect, rather than literal representation. The correct form is more accurately shown on the tablet on the Trenton "Battle Monument."

Of the hundreds of these boats once on the river not one is now known to exist, so far as the writer has been able to ascertain, and he has succeeded in finding but one survivor of all the hardy men who, for so long a period, carried, by these boats,



MCKONKEY'S FERRY, NOW WASHINGTON'S CROSSING.



the products of industry to market and brought back the needed supplies. This man passed away before the completion of this account.

It appears that at one time there were boats on the Delaware, of a type different from the Durham boat, of which the writer has been able to gain but scant information. In Smith's "History of New Jersey," under date of 1765, occurs the following:

"Delaware river, from the head of Cushietunk, tho' not obstructed with falls, has not been improved to any in-land navigation, by reason of the thinness of the settlements that way. From Cushietunk to Trenton falls are fourteen considerable rifts, yet all passable in the long, flat boats used in the navigation of these parts, some carrying 500 or 600 bushels of wheat. The greatest number of these rifts are from Easton downward; and, those fourteen miles above Easton, another just below Wells' Ferry and that at Trenton are the worst. The boats seldom come down but with freshes, especially from the Minn-sinks."

Rates of freight to Philadelphia are given, indicating that city to be the objective point in the trips of these boats, of which the following brief description is given in a note to the article above quoted:

"These boats are made like troughs, square above the heads and sterns, sloping a little fore and aft, generally forty or fifty feet long, six or seven feet wide and two feet nine inches or three feet deep and draw twenty or twenty-two inches of water when loaden."

This description corresponds pretty nearly with the Durham boat in size, but their "square" ends and their designation by Smith as "flat" would indicate a different style of boat, although probably managed in much the same way as the Durham.

Mr. J. M. Van Etten, of Milford, Pa., informs the writer that the boats described by Smith had a bottom slope at the ends to allow them to run easily over slight obstructions. In this connection Mr. Van Etten mentions having seen, some years ago, an article stating that the Durham boats had been seen on that part of the river prior to the building of the Erie railroad, and that they came from Easton or below. He also mentions having himself seen on the river, within four miles of the mouth of the Lackawaxen, Durham boats which brought up merchandise and took away the products of the country.

Although the boats mentioned by Smith are stated by him to have made trips to Philadelphia, the writer has not heard of any tradition of such boats having been seen on the lower river.

Regarding the use of the Durham boat on the extreme upper river, the following is found in a small volume by the late L. W. Brodhead, on the "History and Legends of the Delaware Water Gap," published in 1857.

Mr. Brodhead says: "Long before any facilities, other than the rough wagon roads, were afforded the people, both north and south of the mountain, for the transportation of the products of the Valley of the Delaware to market, the old furnace at Durham on the Delaware, a few miles below Easton, had constructed, about the year 1770, a class of boats somewhat longer and narrower than the present canal boats and in shape somewhat resembling a weaver's shuttle. The deck extended a few feet only, from stem and stern.

"The 'captain,' or steersman, stood on the stern deck, and guided the boat with a long rudder. A narrow planking on either side afforded a walking place for the pikemen, who, with long poles or pikes, propelled the boat up the current.

"These were called Durham boats and soon came into general use on the river. They were used as early as 1780, by John Van Campen, for the transportation of flour to Philadelphia, manufactured from wheat grown in the Minisink. Mr. Van Campen's mill was at Shawnee, and stood near where Mr. Wilson's mill is now located.

"In 1786 one Jesse Dickinson came from Philadelphia, and laid out a city in Delaware county, New York, called 'Dickinson City.' It was situated near what is now called Cannonsville. Mr. Dickinson brought his men and material up the Delaware in Durham boats. (Gould's History of Delaware County.)

"The old firm of Bell & Thomas, at Experiment Mills, known for their energy and integrity, and pleasantly remembered by many still living, used the Durham boats extensively in their day, both in the transportation of flour to Philadelphia and in bringing up supplies for the neighborhood.

"The boatmen were a strong and hardy set of men, and seemed to enjoy their laborious occupation. The 'Captain,' feeling the responsibility of his position, bore himself with great dignity, especially on his arrival at 'port'; and the boys who collected about the wharf, when the vessel hove in sight, were terror stricken at the imperious manner of the 'Captain' and the stentorian tones by which he commanded all alike, on board and on shore.

"After the completion of the Delaware Division of the Pennsylvania canal, the Durham boat began gradually to disappear, so that one is now seldom seen on the waters of the Delaware."

Of the places mentioned in the foregoing, Shawnee is eight or ten miles above the Water Gap, Experiment Mills is on a small stream flowing into the Delaware a few miles above the Gap, Minsi being at its mouth. Cannonsville is a few miles above Deposit, N. Y., nearly a hundred miles above Port Jervis. The date, 1770, given in Mr. Brodhead's book is probably a misprint as the original boat was built some twenty years earlier.

Boats known as "Durham boats" have been used in a number of different localities, a fact which has led to inquiry as to the correctness of the statement that the boat so called originated on the Delaware.

In his "History of Bucks County," General Davis says, "The Durham boat came into use to carry the iron made at Durham furnace to market," and, again, "The product of the furnace was transported to the river and there loaded into Durham boats and taken to Philadelphia. These boats carried the greater part of the freight between Philadelphia and the upper Delaware, before the days of canals and railroads. The testimony of Abraham Haupt says that the first Durham boat was built on the river bank, near the mouth of the cave, by one Robert Durham, the engineer and manager of the furnace, and that the boat was nearly in the shape of an Indian canoe, and the works were possibly named after the builder of the boat. This was before 1750. As early as 1758 Durham boats were used to transport flour from John Van Campen's mills at Minisink, to Philadelphia. The Durhams were in this county (Bucks) as early as 1723."

It appears that Haupt had a blacksmith shop near the original Durham furnace, which was at some distance from the river, and that in his shop, in use for nut cracking, was found the date stone of the original furnace. Haupt's opportunity, therefore, for getting information respecting the matter may be taken as being good. The date on the stone is 1727.

The records of the furnace throw no light on the subject, but the statement quoted would seem to be conclusive as to the origin of the boat. This statement is in entire conformity with the tradition among the river men, although, unfortunately, it is indefinite as to the precise time of building the first boat. The account has been repeated by other writers and has been generally accepted as correct. Indeed it is not to be supposed that so careful a writer as General Davis would accept it without being well assured of its accuracy.

The early product of the furnace, built in 1727, must have been carted to market, over extremely rough roads, or carried

by the river in quite inadequate craft, until a more efficient water transportation could be provided. The necessities of the case would seem to have led to the construction of a suitable boat.

The use elsewhere of boats known as "Durham" has led the writer to make inquiries regarding the matter of similarity, as well as priority of construction.

In the introduction to an early edition of Cooper's "Pathfinder" is found an account of boats in early use on the Mohawk, by which the products of the interior were moved down the stream, toward the Hudson, and the manufactures of the seaboard were carried to Utica and the smaller towns farther west. It is stated that there were two kinds of these boats, one being known as the "Schenectady," which was small, flat-bottomed, and rigged with an ungainly sail, though dependent chiefly on the muscular power of the boatmen with their oars or poles. After the description of the "Schenectady" boat is the following: "The Durham boat, of which there were large numbers, was long, shallow, and nearly flat-bottomed." After some mention of the method of operation by poles, the writer proceeds, "The Durham boats found their way from the Mohawk to the St. Lawrence and were much used on Canadian waters. And it was said that one of these craft went into the Missouri river, making a voyage of six weeks, from the rude wharf at Schenectady." The same writer adds, "The Mohawk boatmen were singularly skillful in those times. They made the trip to Utica, about one hundred miles, against current and rapids, and returned in nine days. Two miles and a half an hour was the usual speed against the current."

Miss Cooper, the writer to the introduction to her father's work, the "Pathfinder," states that this account is from a letter written by Judge Cooper, about 1805.

The difficulties of navigation on the Mohawk, as compared with those on the Delaware, are well shown by the fact that cross-pieces were fastened on the "walking-boards," to furnish footing for the boatmen in propelling the boats.

Mr. Lugar informed the writer that, at one time, he had, as an assistant in his work as carpenter, a man from the Mohawk who knew the boats on that river, and who stated that they differed materially, in size and model, from the Delaware Durham, the latter having partly rounded bottom, while the bottom of the Mohawk boat was flat.

From Mr. W. Max Ried, of Amsterdam, N. Y., author of "Old Fort Johnson," was received the following brief account of the Mohawk boats:

“Very early in the history of the Mohawk valley the Mohawk river was the only means for transporting produce and supplies, except the pack on the trail. Canoes were first used, and then bateaux, which were nothing else but scows propelled by poles and paddles and, in long stretches of still water, by sail.

“Next, the Schenectady Durham, which is described as flat bottom, straight sides, with easy lines at bow and stern, to help flotation in striking a rapid. She was decked fore and aft and along her gunwales, which were cleated to give foothold to the boatmen. A mast was stepped near the bow with square sails.”

Here we have “Schenectady” and “Durham” combined in the title, which leads to the thought that the boat may have been a Schenectady modification of the original Durham.

Mr. Ried further says, “Pearson is authority for the statement that the ‘Durham’ boat was first used on Long Island Sound. The name occurs early as a ‘Dorem’ or ‘Deurem’. The Dorey or Dorry, common along the coast, is thought to be similarly derived.” (History of Schenectady.)

In closing, Mr. Reid gives the Haupt statement, given in the History of Bucks County, to which reference has already been made herein.

The foregoing descriptions of the Mohawk boats do not conform to what we know of the Delaware boat bearing the same name, and, as respects the boats on Long Island Sound, a boat of the model of the Delaware Durham would not be at all suitable for that water, as was shown by Mr. Lugar’s experience in his trip to the Brooklyn Navy Yard; and, if a boat of this model had been in use in that vicinity, it would be difficult to account for the novelty to the men of the navy yard of Mr. Lugar’s boat.

We have something a little more definite in a paper kindly furnished by Mr. Arthur T. Smith, Secretary of the Herkimer County Historical Society, containing an address before that society in 1897, by Mr. Rufus A. Grider, on “The Early Navigation of the Mohawk River”.

From this interesting paper only those parts can here be taken which pertain to our present subject.

Mr. Grider quotes from a journal kept by a Mr. Christian Schultz, while traveling on the Mohawk in 1807, as follows:

“I have noticed three different boats being used in navigating the river. Those called Schenectady boats are generally preferred and will carry about ten tons burden, when the river is high, but when it is low, as at this time, they take three or four.

“They generally advance against the stream at the rate of 18 to 25 miles a day. These boats are built very much after the model of our Long Island round-bottom skiffs, but larger being from forty to fifty feet in length; are steered by a large swing oar of the same length. They have likewise a movable mast in the middle. When the wind serves they set a square and topsail, which at a distance gives them the appearance of a square-rigged vessel coming before the wind.

“Our galley, which, I am just now informed, is called the ‘Mohawk Regulator,’ has gone at the rate of six miles an hour against the stream, and during this time, believe me, nothing can be more charming than sailing on the Mohawk.

“It is not often that a fair wind will serve for more than three or four miles together, as the irregular course of the river renders its aid very precarious; their chief dependence, therefore, is upon their pike poles. These are eighteen to twenty-two feet in length, having a sharp-pointed iron, with a socket weighing ten to twelve pounds, affixed to the lower ends; the upper end has a large knob, called a button, mounted upon it, so that the poleman may press his whole weight upon it without endangering his person. Within the boat, on each side, is a fixed plank, running fore and aft, with a number of cross cleats nailed upon it, for the purpose of giving the poleman a sure footing in hard poling.

“The men, after setting their poles against a rock, bank, or bottom of the river, inclining their heads very low, place the upper end of the button against the front of their right or left shoulder (according to the side on which they are poling), then, falling down on their hands and toes, creep the whole length of the gang boards, and send the boat forward with considerable speed.”

After this particular description of the Schenctady boats and their mode of operation, the writer proceeds: “I have met with another kind of boat on this river, which is called the Dorem or Durham. The only difference is that it is built sharp at both ends and generally much larger and stouter”. After some mention of the “Flats” on the river, he goes on to say, “The boat described above was first made at Durham, in Bucks county, Pennsylvania. Durham is on the Delaware river.

“These boats were made to carry flour to Philadelphia and return with merchandise, by navigating the Delaware. I think they would carry fifty barrels of flour. That river is deeper and larger and less difficult to navigate than the Mohawk.”

It is elsewhere stated, in the paper quoted from, that the boats last referred to were introduced on the Mohawk about 1792, the year of the chartering of the first corporation for navigating that river, which period was many years later than the earliest known use of the Durham boat on the Delaware.

The Durham boat figures also on the Susquehanna, as appears in the "Historical Sketches of Plymouth," by Hendrick B. Wright, which mentions that in 1775, during the Pennamite war, one of the belligerent parties seized Mr. Benjamin Harvey, with his boat, for use in a movement upon the opposing force. Going back to 1774, in giving a particular account of Mr. Harvey, the author says: "At that time, and for many subsequent years, all articles of merchandise were transported on the river in 'Durham boats'. These boats were forty feet in length, with a beam of some ten feet, and would carry from fifteen to twenty tons burden. They were propelled by long 'setting poles,' with iron sockets at the ends, three men on each side, with a steersman at the stern. Ten or twelve miles up the stream was considered a fair day's work.

"These boats were the only means of transportation of merchandise until the making of the Easton and Wilkesbarre turnpike. This thoroughfare was completed about the year 1807. Thence, down to the time of the canal navigation, in 1830, the merchants of the entire valley received all their goods, either by Durham boats on the river or by wagons on the turnpike."

It will be observed that the dimensions and the mode of operation here described differ somewhat from the usage on the Delaware.

After an interesting passage on the old "Conestoga" wagon, Mr. Wright goes on to say: "But in the days of the first merchant of Plymouth, the 'Conestoga' wagon was not known. His transport was the 'Durham' boat. It will be remembered that Benjamin Harvey, that same fair merchant, was at Fort Augusta, near Sunbury, with his boat, in December, 1775, when Colonel Plunkett impressed him and his vessel into the Proprietary service, immediately preceding the battle of Nanticoke."

It would seem that the Susquehanna was well supplied with Durham boats at or near this time, but the writer has not been able to obtain information as to their number or origin on that river. It is not at all improbable that they were introduced from the Delaware, during the quarter century or more which elapsed between the boat building of Robert Durham and the date referred to by Wright.

Something definite has been learned respecting the building of these boats on the Susquehanna as well as at distant western points, from a pamphlet written by the late Mr. J. W. Arndt, published in 1894, and from information received from Mr. P. S. Loy, the son-in-law of the writer of the pamphlet.

It appears that Mr. Philip Arndt, the grandfather of the writer of the pamphlet, had lived at Durham Cave, where the first Durham boat was built, and that he removed to Wilkesbarre about 1800, where he and his son, J. P. Arndt, engaged in business of several kinds, including the building of Durham boats. Philip died soon after and the business devolved upon the son, who, after conducting it for awhile, removed from the place and eventually settled at Green Bay, Wisconsin, in 1824. Here, besides engaging in other business, he, aided by his son, J. W., built Durham boats for use on the Wisconsin and Fox rivers. The boats were not found to be suited to the peculiar character of the former river, but proved eminently adapted to the Fox, where they quickly superseded the boats which had been used there. Mr. Arndt, in his pamphlet mentions that Durham boats were then in use in large numbers on the Delaware and the Susquehanna, and that their use had extended in some degree to the Mississippi. He also mentions that in 1825 his father constructed a small Durham boat, for some special purpose and named it the "Lafayette," from the distinguished friend of America of that name, who had visited our country about that time. The writer has heard of no other instance of giving a name to a Durham boat, as has always been the custom with canal boats and most other water craft. Mr. Arndt's description of these western boats does not differ materially from that of those of the Delaware.

As the Arndts came from the reputed birthplace of the Delaware Durham, it might be inferred that they introduced that style of boat on the Susquehanna. As against this supposition we have the statement before referred to, that Durham boats figured in the warlike proceedings on that river in 1775, unless it be supposed that the writer who recorded those events, long after their occurrence, may have incorrectly applied to the boats of that early time the name used for boats in use at the time at which he wrote. The present writer has found no means of determining this question.

Mr. Oscar J. Harvey, of Wilkesbarre, who has given much attention to historical matters in that region, has reasons to doubt the introduction of the Durham boat on the Susquehanna prior to the close of the Revolutionary war.

Where the same style of boat came into use on other rivers than the Delaware the name of course went with it and the name may have been applied also to other boats by reason of general similarity and mode of operation. Boats of different localities will naturally possess like characteristics where similar conditions exist. Thus, on a narrow waterway, where it is desirable to move in either direction, without turning, both ends are likely to be pointed. A long steering oar would be found desirable where wide movement was necessary in descending rapid streams. Oars to aid the downward passage and sail for up stream would also come naturally into use and the "setting pole" would be universal for rapid streams of suitable depth.

For any of these features it would be difficult to assign the priority to any person or place, but their combination with a model so completely adapted to the requirements of the Delaware river service, and which, as is asserted, could not be improved, warrants the claim for originality for the man who built the first Durham boat on the banks of the river near Durham cave, in Bucks county, Pennsylvania.

The total disappearance of the Durham boat, on the Delaware, is readily accounted for. It was not well adapted for use on the canals, which came into use along the Delaware about 1830, and gradually displaced river carriage. Thus these boats naturally fell into disuse, or were, for a time, used for casual purposes to which they could be applied. At Easton and Lambertville, and doubtless at other points, some were used in collecting boulders from the river bottom for paving the streets of Philadelphia, a method in general use in that city within the memory of many persons now living, and which, the writer is told, still survives in some of the streets.

Besides engaging in that industry and in gathering sand from bars in the river, the last Lambertville boat also served in carrying various kinds of produce, and especially clams from New Brunswick to Lambertville and other places on the canal.

The writer well remembers the interest attaching to the arrival of the "clam boat," as the crowd gathered around the landing. It was the custom of farmers and others to form "classes" for ordering clams, a "class" of a dozen or more agreeing to take a given number of the bivalves, to be received by a designated member of the "class" and divided among them, according as each may have ordered.

An aged man, who, in his youth drove the tow horse of the clam boat, states that it was often hailed from the towpath by persons wanting clams, of whom he was directed to take no

notice, as the supply was not such as to admit of sales to any but those who had ordered.

The freshet of January 8th, 1841, the highest known prior to that of October 10th, 1903, carried away an immense amount of property, including many of the Durham boats which had remained. The last Lambertville boat, after being variously employed, was finally laid up in the canal basin at that place for decay. Mr. Lugar's boat, with which he made the last trip to Philadelphia, in 1865, met a like end in the canal a few miles farther up.

One Durham boat has been heard of, as similarly laid up on the Lehigh, and as having been taken from human ken by the tremendous sweep of the freshet of 1903.

The question still remains as to where the builder of the first Durham boat, on the Delaware, got for it the perfect model so admirably adapted to the requirements. The writer has made some inquiries abroad, to ascertain, if possible, if any such model existed in other countries. The most likely places were thought to be Durham county, England, and the canals of Holland. Careful inquiries in both countries, through the British Museum and persons in Durham county, and of the Ryks Museum in Amsterdam, met with courteous responses, but were fruitless as to any information respecting the existence of boats likely to have been the prototype of our "Durham".

So far, therefore, as the investigations of the writer have gone, it seems that the original story of the priority of the Delaware, in the construction of the boat must be viewed as established, and this paper may be fittingly concluded by presenting a well deserved eulogium upon the boat and boatmen, delivered by one of Pennsylvania's noted sons.

The opening of the Belvidere Delaware Railroad from Trenton to Phillipsburg, opposite Easton, was celebrated on February 3d, 1854, by the running of a train of fifteen passenger cars from Philadelphia, carrying officials and citizens of Pennsylvania and New Jersey, who were enthusiastically received and entertained by the citizens of Easton.

The principal address of welcome to the visitors was made by the Hon. Andrew H. Reeder, who had held the position of Territorial Governor of Kansas and was otherwise prominent in State and Nation.

Taking up the progress in the means of intercommunication, Gov. Reeder made reference to the canoe of the Indian as the earliest craft upon the river, and, before passing to the more modern methods of transportation, pronounced the following





SUCCESSOR TO THE DURHAM BOAT.

eloquent tribute to the Durham boat and the men who operated it:

"But the age of primitive navigation passed by and the march of progress drove the Lenni-Lenâpè and their bark canoes from the banks of their favorite river and the graves of their fathers.

"The well-known river boats next courted its waters, and, in the hands of hardy men, before many years had elapsed, were made to surmount the dangers and difficulties of its navigation and carry the daily trade of the settlement through the dangerous and comparatively unknown rapids that thread the stream to tide.

"Those vessels covered the whole period of its history to the construction of our canal, and the peculiar and well-remembered class of men which the exigence of their use called forth, made their mark upon the time in which they lived. Muscular, active, athletic and enduring beyond belief, faithful and trustworthy to a proverb, sportive and social, yet fearless and ready-handed, they will not soon be forgotten. Always prompt for fun or play, the man who sought their courtesy and good offices was sure to find them, while he who insulted them or wantonly provoked their anger, was sure to learn a lesson that needed no repeating.

"For years they transported to your city all our produce and manufactures, frequently carrying passengers who preferred their craft to the stage wagon, which, twenty years ago, accomplished in two days, by a shorter route, the trip you have made in a few hours this morning.

"They carried for us heavy remittances with a stern honesty worthy of imitation in higher places, and without a single instance of defalcation.

"Such were the generous-hearted, open-handed river boatmen of the Delaware. But progress came again and drove from the stage their long oars and iron-shod poles. As a class, they have passed away, while their feats of prowess and daring are fast becoming traditions to challenge the belief of a new generation."

Thus, in fitting phrase, was well-earned tribute paid to the boats and men, so long and worthily engaged in the "Navigation of the Upper Delaware."









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