

THESIS.

Subject, A Study of Rock No. 4  
and Correlated Subjects.

Name, Lear Minchart

There is nothing that plays a more important part in the settlement and usefulness of a country than a navigable river.

Rivers are not all naturally navigable but the utility of many of our principal waterways has been effected only by the application of art and science.

Such a river is the Monongahela. During the greater part of the year, the water being too low for any crafts drawing more water than the old fashioned keel boats, not much commerce was carried on. Consequently an effort was made in 1832 by Hon. Andrew Stewart of Fayette to persuade the U.S. Government to remove the difficulty by the construction of locks in the river.



Having failed at this point, help was sought from the state. The best that it could do was to authorize, March 31, 1836 the forming of the "Monongahela Navigation Company" to make slackwater navigation from Pittsburg to Virginia state line, about 90½ miles, and as much farther as Virginia would allow it to go."

Though much time elapsed before their completion and the company experienced numerous discouragements from bank failures, destruction of parts of the works by floods, from a prejudiced and ungrateful public, and lack of sufficient returns from toll, the locks are at last constructed and are being successfully operated. The river is at last made navigable and

The country is being settled rapidly, its products are increasing, and its commerce is enlarging with the greatest speed. The U.S. has at last been interested in this valley to such an extent that in July 1897 it purchased the works and rights of the "Company" so that now our slackwater system is owned and operated by the U.S.

Of the eight locks constructed by the "Company", Lock No. 4, just below the flourishing town of Charlevoix, is by far the most important.

The works of this typical lock may be divided into the dam and the lock proper.

The dam consists of tiers of logs, a foot or more square, built up from the bed of the river to the surface



4.  
of the water, where they begin to slope so as to form a comb, like an old fashioned log cabin.

The sides of the structure are held together by logs connecting them. The space between the sides is filled with stone. The slopes above and below are about equal, there being from 3 to 4 feet of slope to one foot of rise. The dam is sheeted above with a double course of oak plank, closely laid, five inches thick, spiked to the timbers, and covered with gravel. The sheeting below is of heavy oak timbers, or spars, flattened to eight inches and spiked to the crib timbers. The dam is about 65 feet wide at the base and about 5 or 6 feet from the bottom to the slopes. The whole dam is about 605 feet in length

5  
and is a segment of a circle with the curve up stream. "It is secured, at the ends, by high, strong cribs filled with stone, and above by double courses of heavy sheet piles, driven vertically into the bed of the river to such a depth as to be secure anchorage to the entire structure."

The lock proper consists of two chambers 190 feet by 50 ft. "The entire length of the walls is 252 ft. and their height about 25 feet. They are 10 and 12 feet thick, built of heavy blocks of dressed stone, laid in hydraulic cement, and securely clamped. They are built upon heavy oak timbers - deeply laid and covered with heavy oak plank - and contain about 10000 perches of stone."



The locks are guarded by substantial cribs and fenders above, below and at the sides. They are constructed so as to allow at least 5 feet of water above the mitre cills, against which the gates close at the lower entrances. The floor consists of heavy timbers covered with heavy plank well spiked"

The water enters and leaves the locks through wicket gates near the bottom of the lock gates.

The gates of the lock nearest the shore and of the side nearest the shore of the outside lock, are worked by water power received from a turbine wheel; this wheel is near the lower end of the central wall and receives its water from a large pipe in

the wall, which extends to the upper end where the water makes its entrance.

The gates nearest the outside of the outside lock are worked by an undershot water wheel on the dam.

The power of these wheels may be used for other purposes as pulling boats out of or into the locks! The locks, built upon the west side of the river, are fitted with a toll house where one of the workmen spends the night so as to be ready at all times to promptly lock boats through.

The lock nearest the shore was finished in 1844 by "Morehead, Robertson, & Co", through the sub-contractors "Lockhart & Thomas", the Superintendent being J. B. Morehead



8

and the Engineer, Sylvanus Lothrop.

The outside lock is of recent construction. Just above the lock is the Company's wharf, used as a harbor for their boats.

On the bank above the lock stands the fine residence of Thomas McGowan a venerable man who helped construct the lock and has been "Supt. of Repairs" of all the "Company's" works ever since.

But of what use is this lock after we have it? Is it of any account? It is valuable in as much as it makes navigation possible thereby maintaining and increasing our commerce.

But to what does our commerce amount? What are our exports?

9.

Which is the greatest? What effect has this upon other products and upon the people?

These must be answered by an investigation.

Our greatest product is undoubtedly coal. We find that millions of bushels pass through this lock annually. In 1868 there passed through the first five locks 45,801,000 bu. of coal, while 5,072,500 bu. of this passed through Lock No. 4, or about one fifth of the whole amount.

In 1896 there passed through the first five locks 142,731,300 bu. of coal or more than three times as much as in 1868. While over one half of this (78,997,900 bu.) passed through Lock No. 4.



10.

This shows plainly the vast increase of trade and the undoubted importance and vital relation of this lock to our commerce.

It is easy to be seen that there is a relation between the amount of coal shipped through this lock and the time of the year.

When Winter approaches, acres of coal are towed away to prepare for the approaching cold weather. And in the chilly Spring after the ice is broken and when the manufacturing plants are in full blast we have our largest export of coal 12,654,800 bushels of the 98,997,900 bushels that passed through Lock No. 4, in 1896, went down in April.

11

there being but 2,990,700 bushels  
towed away in August.

Some coal is carried down on  
the railroads but it does not  
amount to so very much since  
the O. & C. follows the river above  
Lock No. 4 only as far as Browns-  
ville and the O. & L. E. only to  
Belle Vernon, no other roads fol-  
lowing the river until St. Marion  
is reached from whence the B. & O.  
keeps the river company to Morgantown.

Coal though being the greatest  
product is not the only one.  
In places from the Lock to the  
headwaters of the Monongahela  
there exist immense patches of  
timber which are made smaller  
every year by the vast export from  
that region, there passing through



this lock about 2,109,804 feet in 1896..

At Pt. Marion, and numerous other places there are lumber mills which work up a great deal of timber annually. Much of this is used in the vicinity of its production but in 1896, 8,497,199 ft. of lumber were shipped through Lock No. 4 to places down the river.

For the coal mines below, great quantities of pit posts are sent. Horses, hogs, cattle and especially sheep and wool pass through the lock. The production of horses is not as great as formerly owing to the decrease in price. Owing to the decrease in the price of wool, caused by the reduced tariff, the production of sheep is not as great as it used to be, when Washington county

lead the world in the production of sheep and wool.

Many wine producing districts as Wasoutown, and numerous Grist Mills depend upon this route of commerce.

Owing to the unfavorableness of the seasons, not much grain nor fruit has been produced for export in the last few years but ordinarily this has been one of the chief products.

Flat loads of sand and stone are exported often.

From Esibson's, Hamburg's, and other large distilleries great amounts of whiskey and from the breweries, beer are sent through this avenue of commerce.

Also of great importance are the vast numbers of bricks, staves



and made barrels, steel rails, parts of and completed machinery, crocks and jugs, bottles and lamp chimneys, new boats and boat hulls, and thousands of other things that are manufactured in this section of country.

But have these things been simply towed out of this part of the country and heard of no more?

Decidedly not, they have been transported to all parts of the country serving to provide food, clothing, and shelter for millions of people.

The coal has kept them from freezing and has been used to run the great manufacturing plants of the U. S.

So in return the people of the Monongahela valley receive pay for their products, that passed our lock,

13

with which they may buy the necessities of life, produced at home or abroad.

This opportunity for work has drawn many people to this section of the country so that it is now becoming thickly populated and a necessity for social organizations has arisen, consequently schools have been established, as for example the S. W. S. U. S. of California, one of the finest and most successful in the country.

So this Lock No. 4 has been directly and indirectly related to and a potent factor in the history and prosperity of this valley and of the United States.



## Subjects Studied

History, Geography, Physics,  
Geology, Arithmetic,

## Supplementary Reading

Old Fort Duquesne, Frontier Forts,  
Other stories of Braddock, Wash-  
ington, and others.

## Sources of Information.

Thomas M<sup>c</sup>Gowan, Supt. of Repairs  
Mon. Nav. Co. Resides at Lock No. 4, Pa.

Annual Reports of Mon. Nav. Co.

W. W. Jackman, California Pa.

Capt. Henry Wilkins " "

Personal Observation.

