

From Muscle to Machine



The sawmill at Mill Creek is one of the first places at the Straits of Mackinac where machinery replaced people to do work.

Before the water mill was used, people cut boards by hand with a pit saw. Before a round log could be cut into boards, the sides had to be flattened, so the log was squared with the round edges cut off.

First, the log was put on blocks of wood to hold it off the ground. These blocks are called saddle blocks. The log was held to the saddle blocks with pieces of iron called saddle dogs. Saddle dogs were like big staples.

The next step was to score the log. A big axe was used to cut notches into the log on the bark. This helped loosen up the bark along the sides of the log.

Then a broad axe was used to cut off the loosened wood. A broad axe has one flat side and one angled side. It makes the side of a log flat. The handle on the broad axe is different from other axes. It is curved a little so the person using the axe doesn't scrape their knuckles.

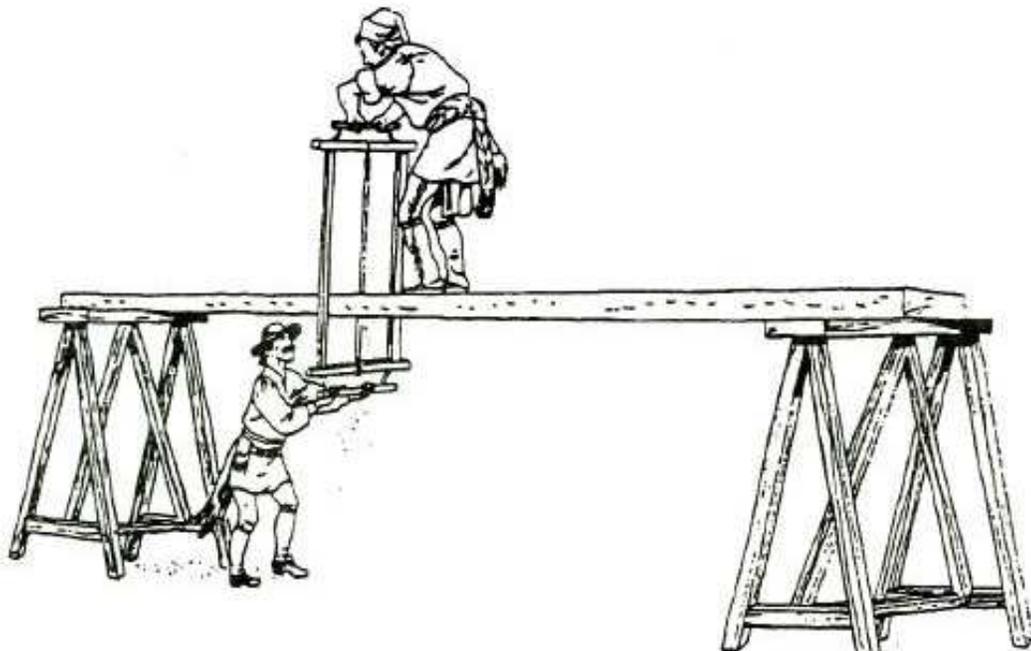
When all four sides of the log was flat, it was time to cut it into boards using the pit saw. A log could be put on top of tall sawhorses and two men cut them into boards with a long saw with two handles.

One man stood on top of the sawhorses. He was called the tillerman because he steered the saw when they were cutting so the boards would be straight. The other

man stood below. He was called the pitman because he stood in the pit. He had to work hard to pull the saw through the wood. It took these two men all day just to cut 14 boards.

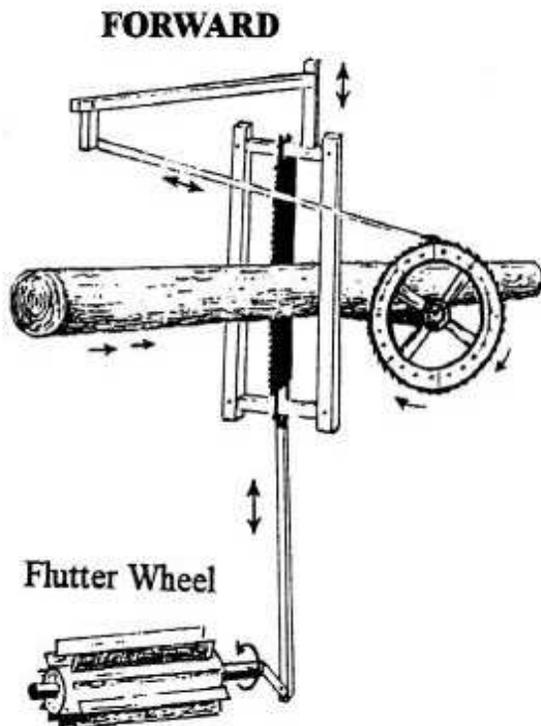
When Fort Michilimackinac was moved to Mackinac Island, they needed a lot of wood for new buildings. It took a long time to cut wood with a pit saw. The boards couldn't be cut fast enough for the builders who needed the wood.

A man named Robert Campbell had a good idea. There was a creek just about 3 miles southeast of Michilimackinac. He built a sawmill at Mill Creek that used the flowing water to move the saw. It was much faster than the old pit saw way had been.



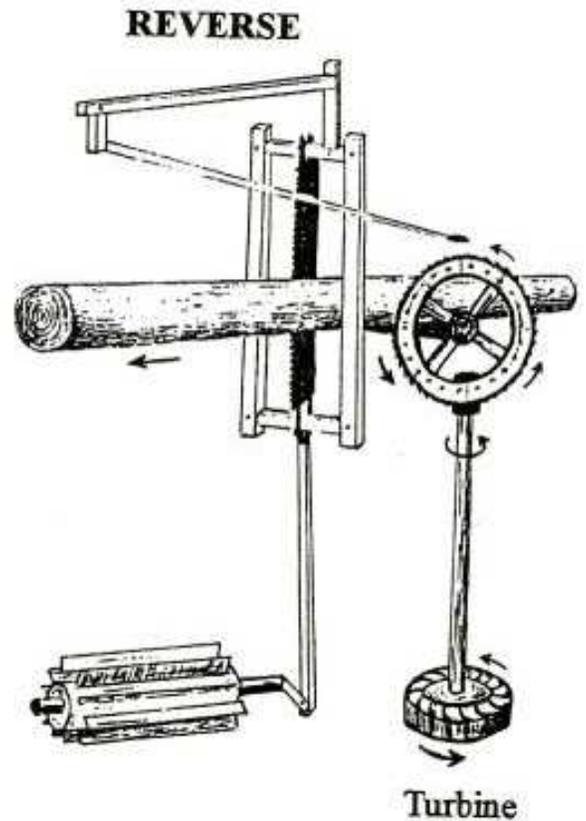
Mr. Campbell built a dam on the creek, to make a pond. A runway, or sluiceway, for the water went from the pond to the mill. When he wanted to run the mill, the sawyer opened a gate in the sluiceway.

When the gate was opened the water came down the sluiceway and fell onto the wheel, which made it turn. The wheel was called the flutter wheel. The flutter wheel had an arm attached to the saw. When the flutter wheel turned, it moved the saw up and down.



While the saw was moving up and down, another arm moved the carriage. The carriage held the log being cut. When it moved, it pushed the log into the saw.

After cutting the log, the sawyer sent the water to another wheel called the turbine. The turbine wheel was also attached to the carriage that held the log being cut. When the turbine turned, it drew the log backwards. The sawyers could move the log over and start another cut and another board.

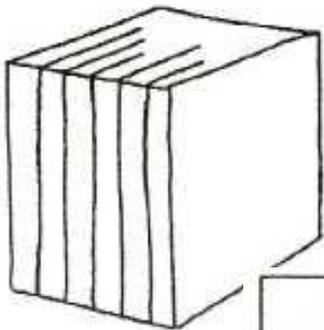


Using the sawmill instead of the pit saw was faster and easier. The water moved the saw blade one hundred times a minute. The mill sawyer could cut as much wood as twenty men working with pit saws.

Many buildings on Mackinac Island were built from boards sawed by the mill at Mill Creek. The sawyers had a good way to get the boards to the island. When the sawyers cut the logs at the mill, they didn't cut the boards all the way through. They left about one foot of the log still together at the end.

These still-together logs were tied to each other and made into rafts. Then they were floated to the island. Once the wood was to the new place across the water, the ends were cut off. These ends were called stub

STUB SHOT

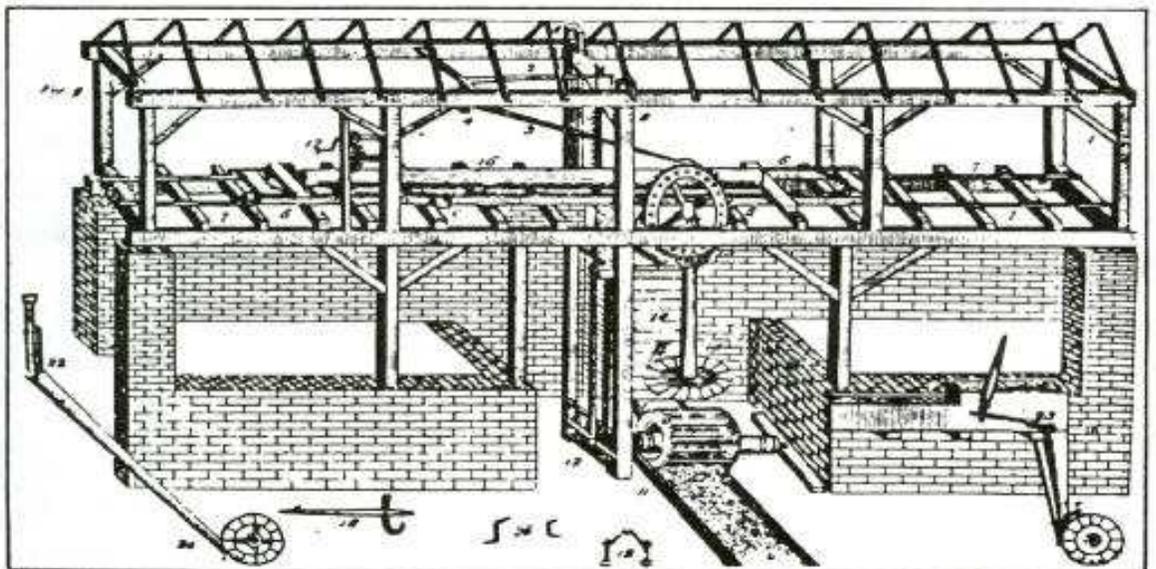


shots. Then the boards were ready to use.

A few years later, after the saw mill was built at Mill Creek, a grist mill was added. Grain, like corn or wheat, was crushed between two stones to make a meal. A wheel turned by the water made a flat round stone turn. Another stone was underneath it, but didn't move.

Grain was poured between the two stones. The top stone would push grain into the bottom stone. The grain would break apart and become meal, or grist. Before a grist mill was used, people had to use their muscle to crush the grain with a hand mill.

Both the saw and grist mill made life much easier for people at the Straits of Mackinac.



Lesson 3

Using From Muscle to Machine

☞ **Read the “From Muscle to Machine”.**

☞ **Discuss the following questions with students during or after reading.**

1. Why did people in the Straits area need sawed wood?
To build homes and buildings. They needed even more when the fort moved from the mainland to the island and many new homes and buildings needed to be constructed.
2. How did a pit saw work?
A person had to use an axe to take the bark off the log and make it square. Two men then had to use their power and energy to cut the log straight through on high sawhorses. It took all day to cut 14 boards.
3. How does a sawmill work?
The water and wheels power the sawblade. The water moved the blade quickly and was much easier than the pit saw.
4. Why was the sawmill better to use than the pit saw?
One sawyer could cut as much wood as twenty men working pit saws. You could use water power instead of people power, which ran out more quickly. You could cut more boards with the saw mill, the blade moved 100 times a minute, than with a pit saw - about ten times more.
5. How were boards transported to Mackinac Island? How did they keep them together?
Boards were transported by water to the island. They floated them across and kept them together by not cutting through the end of the log.
6. What other way was the mill used besides sawing wood? How did people have to do this before?
It was also used as a grist mill. Grain was crushed between two stones that ground it up into meal. People had to use a small hand mill before the faster gristmill was used.
7. What natural resources would you need to build a water powered sawmill?
You would need to have a stream, river or creek. You would also need trees to build the mill and trees to saw in the mill.

GLCEs that may be reached in Lesson 3:

3-H3.0.5 Use informational text and visual data to compare how American Indians and settlers in the early history of Michigan adapted to, used, and modified their environment.

3-G5.0.1 Locate natural resources in Michigan and explain the consequences of their use.

3-G5.0.2 Describe how people adapt to, use, and modify the natural resources of Michigan.

3-E1.0.3 Analyze how Michigan’s location and natural resources influenced its economic development.

☞ **Use Activities 10, 11, 12 to further support the ideas in the “From Muscle to Machine”.**

Vocabulary Words: gristmill pit saw pitman
 Robert Campbell sawyer stub shots
 tillerman

WHAT DID YOU LEARN?

Read the story, then answer the questions.

1. How were boards cut before the water powered sawmill at Mill Creek?

- a. chainsaw
- b. just by axes
- c. pit saw
- d. by other states

2. What was the main difference between the pit saw and the sawmill?

- a. the pit saw was faster
- b. the sawmill was faster
- c. the pitsaw used water
- d. the sawmill needed a pitman and a tillerman

3. What did Robert Campbell do to Mill Creek in order for the sawmill to work?

- a. built a fort
- b. built a canoe
- c. built a horse carriage
- d. built a dam to make a pond

4. How was a grist mill used?

- a. to saw wood
- b. to grind grains
- c. to crush stones
- d. to grind cornmeal

WHY DID THEY BUILD IT?

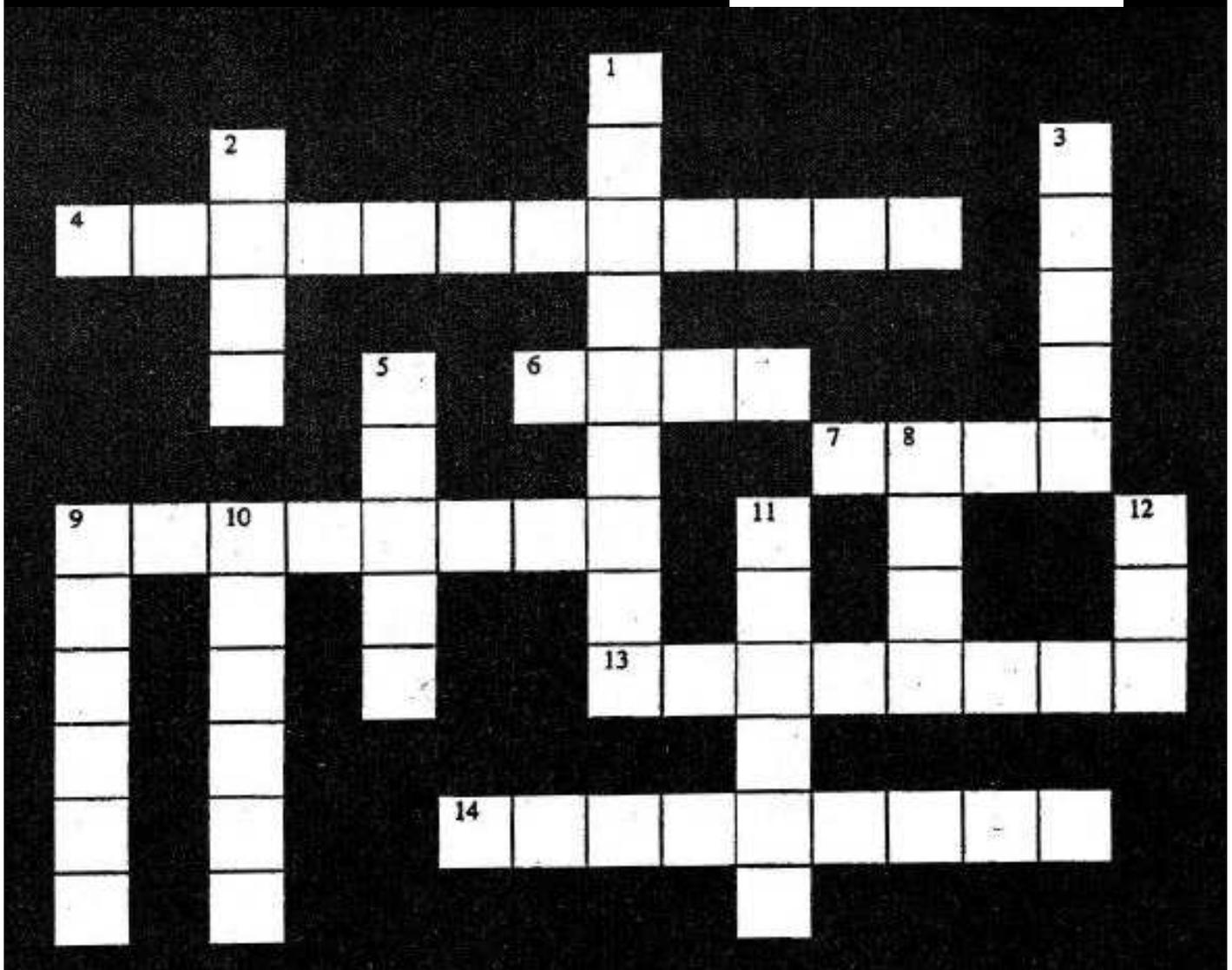
1. What natural resources would you need to build a water powered saw mill?

2. Why was the place where Robert Campbell picked a good site for a saw mill?

3. Why did people want to live at the Straits of Mackinac then? What was the main industry that brought them to the Straits of Mackinac at that time?

4. How did the fact that people moved and lived in the Straits area affect the sawmill at Mill Creek?





ACROSS

- 4. Moved the saw blade (2 words).
- 6. Ground into grist.
- 7. How boards got to Mackinac Island.
- 9. Moved the log backwards to be cut again (plural).
- 13. The cut-off end of a log (2 words).
- 14. Where Mr. Campbell built his saw mill (2 words).

DOWN

- 1. Held the logs in the pit saw (plural).
- 2. What the pitman had to do to the saw.
- 3. Ground up grain.
- 5. Stone that ground up the grain.
- 8. Used to get log ready for the pit saw (plural).
- 9. Kept the saw straight in pit saw.
- 10. First name of the man who built the mills at Mill Creek.
- 11. Water runway to the mill.
- 12. Where wood was sawn before the mills (2 words).

D T O H S Z B U T S C N Y U U
 K K P F M G R I S T M I L L S
 J I N A M R E L L I T P E A B
 S L F P T Z M C I L P E W R S
 A H O O T C A G W O Q M O D G
 C A R R I A G E N I I A M R G
 K I T L V E S D A L D V N U D
 C D M A X G A A L A P N A F M
 A M A D Y R W F X N U T M J Z
 M J A X R A Y E P W A S T I P
 P L Q V U I E S E R A G I W Z
 B J K K I N R X I J H F P X S
 E V N R S L U I C E W A Y V B
 L F V E N O T S D N I R G R H
 L N S S A D D L E B L O C K S

Find these words used in the “From Muscle to Machine” story backwards and forwards, up and down:

- | | |
|-----------|--------------|
| GRAIN | PIT SAW |
| BROAD AXE | TILLERMAN |
| GRISTMILL | SLUICEWAY |
| STUB SHOT | SADDLEBLOCKS |
| SAWYER | POND |
| PITMAN | GRINDSTONE |
| SAWMILL | CAMPBELL |
| CARRIAGE | DAM |

In Their Shoes

Pretend you are living during the time Robert Campbell built the sawmill at Mill Creek. You are trying to build a home on Mackinac Island. Describe how you would have gotten sawed wood before, with a pit saw, and how you get the wood now. Tell about the differences in the process of sawing the wood and how it is transported to you on the island. Here are some questions you will not want to forget to ask when you are writing your story!

1. What were the differences between the pit saw and water powered sawmill?
2. Why would you want to live on Mackinac Island during this time period? What would your profession be?
3. Why is the sawmill faster than the pit saw? How does the sawmill work?
4. Why would you build a sawmill near a creek and near Lake Huron?
5. How is the wood transported to you on Mackinac Island?
6. Draw a map showing where the wood came from and where the wood is transported to you on the island (perhaps use maps from Activity 6 or your history book).

