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**Gray's Mill: Email Reply from Ted Hazen, June 10, 2001**

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Status: U  
X-Originating-IP: [63.23.231.123]  
From: "Theodore Hazen"  
To: awb02@sprynet.com  
Subject: Re:  
Date: Sun, 10 Jun 2001 16:40:49  
X-OriginalArrivalTime: 10 Jun 2001 16:40:49.0554 (UTC)  
FILETIME=[1B088720:01C0F1CC]

Dear Anne,

Thank you for your email. Granite millstone were mainly used to grind corn. French millstones were mainly used to grind wheat and produce white flour. They were three times more expensive to purchase and harder to dress. If the French millstone was used to grind animal feed that could not have been its original intended usage. It would be a waste of a good imported millstones. They were the best millstone material ever discovered to grind wheat and produce white flour. In today's world, a domestic pair of millstones would cost between 3 to 5 thousand dollars, and a pair of French millstones would cost between 35 and 45 thousand dollars, plus the import costs. I would imagine the French millstones ground wheat before they were used only to grind animal feed. It would be a later secondary use for them. Not an original more of a make-do or adoptive later use for them.

I guess there is a variety of ways people in New England spell Johnny Cake, as Jonny Cake. I guess there would be different spellings since the name came from Journey Cake. A cake baked on a large flat stone against the fire that you made while on a journey. I know that these cakes are made out of corn and were introduced by the Native Americans to the settlers.

A good example of one of these mills still operating is Kenyon's johnnycake flour mill in Usquepaugh, Rhode Island.  
<http://www.kenyonsgristmill.com/index.html>

The name "Red Dog," for ship's biscuit or middlings came from New England as well. A local Native American cheif whose name was Red Dog made an agreement to take all of the ship's biscuit or middlings that the miller could supply the tribe. At one time the millers threw this stuff the middlings and the bran into the streams because there were considered waste or termed offals.

The corn is usually shelled in a corn sheller before hand. Only a small percentage of the corn cobs can be used in animal feeds. Generally you only grind corn cobs into pig feeds and not cattle feeds. A corn cracker is a piece of milling machinery that produces cracked corn. You can set the machine for making different numbers of cracked pieces from each kernel. The term corn cracker is also applied to a small rural mill that has a very small output and production rate. Generally the old saying goes that a kid can eat it faster than what the mill could grind it. So the term can mean two things. Now when you said, "crush the corn and the cob." Crush is not a good word to use and it is incorrect term to be used in the milling processs. Nothing is ever "crushed." The problem with crushing grains is that the oil would be released from the germ into the meal, and it would quickely turn rancid. Crush also implies that the grinding surfaces come into contact with each other which is never the case. The millstones never touch each other and the furrows on the grinding surface of the millstones sheer the grain like a pair of sissors. The corn crackers and hammer mills force grain to pass through different mesh

screens sort of like a cold slaw shredder. It is still sheered by the hole openings in the screen.

The Meadows Mills use granite millstones from North Carolina. Before Meadows became Meadows it was known as Williams Mills.

Meadows Mills, Inc., Page, Meadows Stone Buhr Mills, North Wilksboro, N.C.  
<http://www.meadowsmills.com/>  
Meadows Mill Company, Manufacturers of Sawmills, Hammer Mills, and Stone Burr Mills 1352 West D Street, Post Office Box 1288, North Wilksboro, North Carolina 28659 (800) 626-2282, (336) 838-2282 meadowsmills@worldnet.att.net

New River Mills, New River Stone Buhr Mills, Scottesville, N.C.  
<http://www.newrivermills.com/>  
Edward Wingle, Scottesville, NC 336-982-2323 ewingle@newrivermills.com

New River Mills, New River Stone Buhr Mills, Scottesville, N.C.  
<http://www.forthrt.com/~hduncan/>  
Hank Duncan, 150 Haunted Branch Road, North Wilkesboro, NC 28659 336-838-1260  
hduncan@newrivermills.com

When you say reaction wheel, I first think of a barker wheel developed by Dr. Barker in the 17th century. Water is introduced in a round pipe (or funnel) with two arms projecting from the bottom. The discharging water through small openings causes it to turn backwards giving the wheel a rotary motion. They sort of work like a lawn sprinkler.

A spiral iron enclosure, seems like three possibilities. These type of wheels were mainly used in the North. The first is the spiral discharge wheel. The best way to understand this type of wheel is to think of a top windmill or pin wheel. Generally they are mounted in pairs on a horizontal shaft. The second one is a rose wheel. The water wheels is driven by a spout of book causing the water to strike two or three opposing buckets at right angles causing the buckets to turn in opposite direction. The wheel was used on vertical or horizontal shafts, in pairs or singly. The spiral of the open buckets looks much like an open rose. Some times for the rose wheel to work economically they have to be used in pairs on a horizontal shaft. They were some times used in place of flutter wheels (a time of small diameter undershot water wheel) used in up and down saw mills. The third a spiral, or screw flood wheel. These types of wheels were seldom used in this country. They work much like a screw propeller. I understand that these types of wheels may have been first used in the Genesee Valley Between Rochester and the Alleghanies before the building of the Genesee Valley Canal. Neither one of these two water wheel are what would be really termed a water turbine. Basically all turbines could be termed "reaction" wheels, because if you have water flowing in one direction that causes the wheel turn in the opposite direction. I know that these types of wheels were developed prior to 1870. I have an 1870 millwrights book sitting here that mentions the spiral wheel with a section of its own.

Did I mention to you a book called "Little Old Mills," by Marion Nichol Rawson (1878-1956), New York: E. P. Dutton and Company, 1935, New York, Johnson Reprint Corp. 1970. It is not a highly technical book about mills but contains a lot of the folklore and character about mills. She wrote about a dozen or more books most of them she illustrated herself. If you look at her book "Forever the Farm," New York: E. P. Dutton and Company, 1939. If you look at her drawings of different types of fences and roofs you will discover where perhaps Eric Sloane later got his ideas for his drawings and books.

Harry Bischoff Weiss (1883-1972) He did about 30 some books either by himself, with his girlfriend that later became his wife Grace M. Ziegler, or with Robert J. Sim for the New Jersey Agriculture Society. They are a great source of information on different types of mills and trades.

A mill build 24 by 24 may be small but a lot of tub mills were only 10 by 10 or 12 by 12, 14 by 14, with a single pair of millstones being powered by a single horizontal water wheel. South Dartmouth, Massachusetts would also be along part of the coastal areas were they would have had tidal powered mills. They did use horizontal water wheels on tidal powered mills, they did not all have vertical water wheels. A lot of the early mills of this area were wind and tidal powered mills. That is not to say that they did not build stream powered mills in the 1600's.

As for the star drills. Most people think of them as being used in pneumatic hammers. But I am pretty sure they were used by hand before that. One person would hold the drill bit and rotated it slightly after each time the striker hit the drill. I am getting ready to move very soon so most of my reference material is either packaged up in boxes and an in a storage locker. A blacksmith could make a star drill just as easily as a twist drill bit. I think the first books on blacksmithing came out in the 1840's or 50's that would have had formulas and told blacksmiths how to make things. A web page that is in the process of being constructed that may help in your search is Stone Quarries and Beyond ^ Quarries ^ Quarrymen ^ Stone Cutters & Stone Carvers ^ Dealers of Stone & the Finished Products <http://freepages.history.rootsweb.com/~quarries/> When they contacted me several weeks ago about linking some of my pages to their site they had not put up its content as of yet. The person that contacted me was Peggy Perazzo, compiler, Pat Perazzo, webmaster perazzo@ccnet.com Antioch, CA

I don't mean to be a pest by writing back. I guess I spent just too many years working for the National Park Service. So I don't like people having a misunderstanding of history or how things work. Another thing that they pounded into my brain was if you are going to tell someone something, you should be able to go to the reference material and show where the information or concept came from. Some times it has taken me years to find or come across where I found some bit of information to then be able to prove the statement.

Thank you,  
Ted

From: "Anne W. Baker" <awb02@sprynet.com>  
To: trhazen@hotmail.com  
Date: Sat, 9 Jun 2001 11:03:20 -0400

Wow! Email is great. What a rich and informative reply. Thank you.

To make this issue clearer I am going to start with the mill . The remains of the existing building dates to the 1880's. It is a typical small, one story village mill, 24x24. This mill and many of the small mills in this once rural area were a combination of grist and saw mill. Consistently I find 2 sets of stones - one granite for grinding Jonny cake meal and the other French burr for grinding livestock feet. In addition there is always a corn-cracker, turned by water power, to crush the corn and the cob which was then ground in the French burr stones. Having looked at and researched the remains

of other mills in the immediate area they all served those basic needs. All were originally powered by wooden wheels but had been modernized, with a turbine. I should explain here that they were not turbines as I understand them, but somewhere in between called, I believe, reaction wheels which were attached to the bottom of the penstock, and received the water through a spiral iron enclosure. Jonny Cakes by-the-way, were introduced to the first settlers by the Indians. They are made with flint corn, a while corn meal. Jonny cakes are strictly local to Rhode Island and its Massachusetts borders. There are a few people that still grow and grind the flint corn (using a meadows mill) and many that still eat them. To prevent cross pollination the corn has to be grown at least a mile from any other type of corn and then you're lucky if you get 2 ears to a stork!

In this same area, in addition to the grist and saw mills, there were shingle, bark, forge, hoe, fulling, and carding mills. Most have disappeared except for the foundations and tailraces which were always made of granite as it is in abundance. Most of the stones I have seen have been cut with a star drill which I believe was introduced in the mid 1800. If I can find out a reliable date when the star drill came in to use along with the type of previous drill used and the mark it left, it would help the dating process.

About HABS-HAER. The mill is in South Dartmouth, Massachusetts, close to the Rhode Island boarder. It has not been documented by HAER but all the existing material has been measured and drawn by an architectural historian.

Now I am going to go and look up some of the sites you suggested.

Thanks for your help and time.  
Anne

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Anne W. Baker  
29 Drift Rd.  
Westport, MA 02790  
508 636 3272

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