Yankee Ingenuity:

Cotton and Muskets

Back in colonial times, Americans raised most of the food they ate and made most of what they wore. They spun their own yarn, wove their own cloth, and stitched their own clothes. They dipped candles and built tables and chairs. Wealthy colonists who wanted fancy dishes, fine cloth, elegant furniture, or handsome books sent to England for them. Most manufactured goods were made in England; raw materials came from the colonies.

It was a system that worked well. America provided lumber, pitch, tobacco, cotton, and grains. England took those raw materials and turned them into usable products that could be sold around the world.

During the American Revolution the system stopped. Wham! Suddenly there was no place to send raw materials and no supply of fine goods. What did the colonists do? They used their heads. They looked for new markets for their raw materials. Their ships sailed to faraway places: to Spain, to China, to India, to Turkey.

After the war the new United States began trading with England again. But American society was changing. We were now a democracy with a strong and growing middle class. It wasn't only the very rich who wanted to buy things. Ordinary people wanted them, too.

In England something was happening that could make that possible. That something was an "industrial revolution." Let me explain. It is the end of the 18th century, and if you want a new shirt, this is what you have to do:

Take some wool, or flax, or cotton, and sit down at a spinning wheel. Try wool. You have to turn that sheep's wool into yarn. That takes carding (combing) and then spinning. It is a slow process. Since you've been working all winter, you do have a supply of yarn. How about dipping the yarn in indigo (blue) dye? Now, unless you plan to knit your shirt, you're still not ready to make it. You need to sit at a loom and weave the yarn into cloth. When you've done that, then, finally, you can get a scissors, cut out a pattern, and sit back with your needle and thread and start sewing. Do you now see why you have only two shirts, one for everyday and one for church?

And here is what Lucy Larcom had to say (you'll read more about Lucy in a minute):

*I think it must have been at home, while I was a small child, that I got the idea that the chief end of woman was to make clothing for mankind .... I suppose I have to grow up and have a husband, and put all those little stitches into his coats and pantaloons. Oh, I never, never can do it!*

Well, something was happening in England that was changing that made-at-home way of making things. **It** was a revolution—an industrial revolution (although no one called it that for a while). **It** was a new system of organizing work, based on new ideas in science and technology and business.

Things once made at home were being made faster, and sometimes better, in factories. Tasks were divided in new ways. People began working in teams, and that was much more productive than working alone. **It** was machinery that made it all possible. Americans wanted some of those machines.

The English weren't about to share their new knowledge. They wanted to be the only ones with the machinery that made factories possible. They wanted to keep the Industrial Revolution in England. They wouldn't let anyone who worked in a cotton factory leave England.

Some Americans offered a big reward to anyone who could build a cotton-spinning machine in the United States. Samuel Slater, a young apprentice in a cotton factory in England, had a remarkable memory. He memorized the way the machines were built. Then he ran off to London. In London he pretended to be a farm worker. He didn't tell anyone he had worked in a cotton mill. It was 1790 when he sailed for America; he brought the key to the Industrial Revolution with him.

Slater built a small factory next to a waterfall on the Blackstone River at Pawtucket, Rhode Island. (Moses Brown and William Almy were his partners. They provided the money.) Waterpower turned the machines that spun cotton fibers into yarn. Soon there were spinning mills beside many New England streams. (Women working on hand looms in their homes wove Slater's yarn into cloth.)

Now that factories could turn cotton into yarn—quickly and easily—you can see there would be a great demand for raw cotton. Anyone who could grow cotton would make a lot of money. Cotton grew very well in the southern states.

The cotton that grew in the coastal region was easy to use. It was called "long-staple cotton" and it had seeds that fell right off the cotton bolls. But the tidewater coastal lands were in poor shape. There wasn't much good land left. People didn't practice scientific farming. They often destroyed land by growing the same crops year after year. Then, when the land was no longer productive, they moved on.
Short-staple cotton was the only cotton that would grow inland. However, short-staple cotton has lots of dark seeds, and those seeds stick to the cotton bolls. You can’t spin cotton that is full of black seeds. It took a worker all day to remove the seeds from just one pound of cotton. If only there were an easy way to get rid of those seeds ...

Eli Whitney heard all about that problem when he came to Savannah, Georgia, to take a job as a teacher. Whitney, a New Englander with an inventive mind, had just graduated from Yale College. It took him very little time to come up with a simple machine that removed seeds from cotton. He called it a "cotton engine"-the name was soon shortened to cotton gin. Instead of taking all day to remove seeds from a pound of cotton, a worker with a cotton gin could clean 50 pounds of cotton in a day-and clean it better than he ever could by hand.

The invention of the cotton gin, in 1793, did something that no one expected: it encouraged slavery.

The South had been having economic problems. Slavery wasn't as useful as it had been in the early colonial days. Tobacco had used up the soil. There wasn't enough work for the slaves. Many slaves were set free because owners no longer wanted to feed and house them. Thomas Jefferson and the other Founders thought slavery might gradually disappear.

Eli Whitney's cotton gin changed things-really changed things.

If you could grow a lot of cotton you could get rich. So Southerners looked for land to grow cotton and workers to plant and harvest it. Slaves became very valuable again. Whitney didn't mean it, but his invention helped turn the American South into a slave empire. It made the South into a land of cotton. It kept it rural.

At the same time, the North was becoming urban and industrial.

It began in earnest after 1810, when a Boston businessman named Francis Cabot Lowell took a trip to England. While he was there he visited a cloth-making factory. (Remember, in the U.S. cloth had to be made on hand looms.) Lowell was able just to look at the English power looms and understand the way they were built. No one believed that could be done. When he came home to America he built a factory that was even better than those in England. Lowell's factory had machines for both spinning and weaving. He took cotton fibers and turned them into finished cloth-all in the same building. Even in England, no one had done that.

Once you get started with machines and technology, one invention seems to lead to another. In the old days most things were made from start to finish by one worker. A musket, for instance, was made by a gunsmith who would make guns one at a time. No two muskets were exactly alike. If a musket broke you had to find a gunsmith to repair it. Think what that means on a battlefield.
Eli Whitney began making muskets with interchangeable parts. In a factory one person could make all the stocks and another all the barrels. The parts from one musket would fit every other musket. It was very efficient. It had another big advantage. Can you see what it was?

Suppose a part broke. If parts are interchangeable you can fix a musket by taking parts from another musket. Think of the advantage of that on a battlefield. It was a simple idea-like the cotton gin—but it changed industry. Eli Whitney wasn't the first to design interchangeable parts. But when he showed his muskets to a group of politicians that included President John Adams and Vice President Thomas Jefferson, he made the idea popular.

Slater, Lowell, and Whitney helped bring the factory system to America. There were big advantages to the system, but disadvantages, too. The skilled craftsman, who took pride in his work and used his mind as well as his hands, became rare. Unskilled workers could now do things that only artisans had been able to do in the past.

Factory goods cost much less than handcrafted goods. That meant that ordinary people could afford things they had never been able to buy before. That made life better for most people, but not for everyone.

Work in the factories was mind dulling. Workers did the same task, over and over and over. "What can be expected of a man who has spent twenty years of his life in making heads for pins?" asked a Frenchman who visited some factories.

The air in the cotton mills was full of tiny, almost invisible cotton fibers that got into your lungs (and sometimes led to cancer or other ailments). Those new spinning machines and looms were big and powerful and had no safety devices. If a worker's hand slipped, she might lose it. The noise was deafening—some workers actually went deaf. Factory lighting was usually poor—that didn't help your eyesight.

Some of the workers in the factories were children. Some were as young as seven years of age. How would you like to work in a factory instead of going to school? Sounds good to you? Well, children often worked 10 or more hours a day.

Lucy Larcom was a real girl. When she was little, a neighbor called Aunt Hannah, who kept a small school, taught her to read. They sat together near the kitchen fireplace. As Aunt Hannah twisted the thread on her spinning wheel, she pointed out words in the spelling book with a pin. Lucy was quick to learn. Soon Aunt Hannah taught her to read the stories in the Bible. Then Lucy went to school. Lucy loved school; she wanted to go on, to learn more, but... alas, I could not go. The little money I could earn—one dollar a week... was needed by the family. Lucy went to work in a factory.

Francis Lowell hired young farm-women for his factory. Lowell housed them in dormitories and saw that they lived well and got fair salaries. But other factory owners took advantage of workers, especially women and children. They paid them poorly and made them work long hours.
Some mill owners built mill villages. They provided whole families with jobs, houses, schools, churches, and stores. It sounded good, and sometimes it was, but it gave the owners control of the workers' lives. Then they could do almost anything they wanted. Mill owners in Pawtucket lengthened the workday and cut wages at the same time. (The women weavers led a "turnout." It was one of the nation's first strikes.)

Those factory workers were taking part in two revolutions. The first was that Industrial Revolution; Slater and Lowell had helped bring it from England to America. The second, which was related, was a market revolution. That means the United States was going from a self-sufficient farm economy (where most families took care of their own needs, and rarely used money), to a capitalist market economy, based on jobs and money (where people earned wages and bought goods in markets and stores). These revolutions were just getting under way when Andrew Jackson became president. Once they got going they moved quickly and broadly. Revolutions do that—they change more than anyone ever expects.