

THE KING OF COTTON

When you hear the name Eli Whitney, you probably think of his invention, the cotton gin. But you may not realize how profoundly it (and his other inventions) changed the world.

Here's the history they never taught you in school.

LOOKING FOR WORK

LIn 1792 a 27-year-old Massachusetts Yankee named Eli Whitney graduated from Yale University and landed a tutoring job in South Carolina. He was glad to get it—he needed the money to pay off his school debts. But when he arrived there he discovered that the job paid half of what he'd been promised, which meant he'd never be able to save any money. He turned the job down.

Suddenly he was jobless, penniless, and stranded in the South, hundreds of miles from home. But he'd made the trip from New York with a friend named Phineas Miller, who was escorting his employer, a widow named Mrs. Greene, back to Georgia. When Greene invited Whitney to spend a week at her plantation outside of Savannah, he gladly accepted. He had no place else to go.

Whitney repaid Mrs. Greene's generosity by designing an embroidery frame for her. Greene was impressed by the cleverness of the design, and it got her thinking. If Whitney was this clever, maybe he could solve a problem that plagued her and other planters—how to "gin," or remove the seeds from, cotton... without doing it by hand.

Upland cotton, the only kind that grew in the interior regions of the South, had seeds that were "covered with a kind of green coat resembling velvet," as Whitney put it. These fuzzy seeds stuck to the cotton fibers like Velcro. Removing them by hand required so much labor—one person could clean only about a pound of cotton per day—that upland cotton was essentially worthless.

MASS PRODUCTION

If a way could be found to remove the seeds more easily, upland cotton had the potential to become a very valuable export crop. Why? The Industrial Revolution had transformed the English tex-

The word *ecology* comes from the Greek word for "household."

tile industry (which turned the cotton into thread and the thread into cloth) into a monster and caused demand for cotton to soar.

As late as the 1730s, spinners and weavers made cloth just as they had for centuries: slowly and by hand. One person, sitting at a spinning wheel, could spin raw cotton into only one string of yarn at a time. It took 14 days to make a pound of yarn, which one or two weavers could then weave into a single piece of cloth.

In the mid-1700s, English inventions with colorful names like the flying shuttle (1733), the spinning jenny (1764), the water frame (1769), and the mule (1779), changed all that; so did the introduction of steam power in 1785. Now a single unskilled laborer—even a child or someone formerly thought too old to work—could tend machines that made hundreds and eventually thousands of strands of yarn at once, or that wove it into yards and yards of cloth, faster than the eye could see.

THE BIG BANG

Because of these inventions, the English textile industry's appetite for cotton became enormous and grew exponentially from year to year. In 1765 spinners and weavers in England had turned half a million pounds of cotton into cloth; by 1790 the new machines were consuming 28 million pounds of cotton per year, nearly all of it imported from other countries. As demand for raw cotton soared, it got harder and harder to find enough of it to feed all of the new machines.

How much of the imported raw cotton came from the American South? Almost none. As late as 1791, the year before Whitney arrived in Georgia, exports for the entire South totaled a few hundred bags at most. But not for long.

NO PROBLEM

So how long did it take Whitney to solve the problem that had vexed Southern planters for years? Ten days. It took several months to perfect the design, but after just 10 days, this Yankee, who'd landed at Greene's plantation purely by chance, managed to invent this revolutionary machine.

The design was so simple that it was a wonder nobody else had thought of it before. It consisted of a wooden roller with wire "teeth" that grabbed the cotton fibers and pulled them through a

Q: How did the names Jessica and Sylvia become popular? A: Shakespeare used them in his plays.

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slotted iron screen. The slots in the screen were wide enough to let the teeth and the cotton fibers through, but they were too narrow for the seeds, which separated out and fell into a box.

A rapidly rotating brush then removed the cotton fibers from the teeth and flung them into a bin. This allowed the user to feed raw cotton into the machine indefinitely, without having to stop every few minutes to clean the teeth.

Using Whitney's cotton gin, in one day a laborer could clean as much as 10 pounds of upland cotton, which before would have taken 10 days to clean by hand. If a larger gin powered by water or a horse was used, a laborer could clean as much cotton in one day as would have taken more than seven weeks to clean by hand.

BRAVE NEW WORLD

Over the next several decades, Whitney's cotton gin transformed the South. Tens of thousands and eventually millions of acres of wilderness were cleared to make way for enormous cotton plantations. By 1810 U.S. exports of cotton to England had grown from almost nothing to 38 million pounds, making the South the largest supplier of cotton to that country.

And that was only the beginning. By the start of the Civil War, the Southern "cotton belt," as it came to be known, was exporting 920 million pounds of cotton to England each year, more than 90% of its cotton imports. Cotton had become, as one historian described it, "the largest single source of America's growing wealth." Cotton was king.

THE CLOTHES ON YOUR BACK

But Whitney's invention had more far-reaching effects than increasing U.S. exports. The industrialization of cotton production vastly increased the supply of cotton cloth. That changed cotton from one of the most expensive fabrics on Earth to one of the cheapest—and in the process, it clothed the world.

Between 1785, the year that steam power was introduced to the textile industry, and the early 1860s, the price of cotton cloth fell by more than 99%. That's the equivalent of a price of Tommy Hilfinger jeans falling from \$5,000 to \$50.

In the past almost no one had been able to afford cotton, (how many \$5,000 pairs of jeans could you afford?)...and things like

leather and wool made poor substitutes. (Don't believe it? Treat yourself to a pair of wool underpants and you'll see what we mean.) "Most of humanity," historian Paul Johnson writes in *A History of the American People*, "were unsuitably clothed in garments which were difficult to wash and therefore filthy."

Cheap, abundant cotton cloth changed that, too. "There is no instance in world history where the price of a product in potentially universal demand came down so fast," Johnson writes. "As a result, hundreds of millions of people, all over the world, were able to dress comfortably and cleanly at last."

CHAINS OF COTTON

There is yet another aspect to Eli Whitney's cotton gin—an ugly, inhuman side, that cast a shadow over all of the good it did. Many Americans think of Whitney's invention as an emancipator, a machine that freed the slaves from having to do the hand ginning of cotton. On the contrary, the rise of cotton cultivation in the South actually helped to entrench the institution of slavery, condemning millions of black Americans to its horrors just when many opponents of slavery thought it might finally be dying out.

Between 1775 and 1800 the price of slaves had fallen from about \$100 per slave to \$50, and abolitionists predicted that if the institution were left alone, it would die on its own. Or at the very least, as slavery weakened, it would become easier to abolish.

But the invention of the cotton gin changed everything. As the amount of acreage brought under cultivation in the South soared, so did the demand for slaves to work the plantations. Between 1800 and 1850, the price of a slave rose from \$50 to as much as \$1,000. Slavery, formerly thought to be in decline, quickly became integral to the new Southern economy.

As such, the leaders of the Southern states became increasingly militant in their determination to defend it and even expand it beyond the South. For a new generation of Southern leaders, the institution of slavery—because of the prosperity that came with it—was something to be defended, even to the death.

The cotton gin had made it happen...and made the Civil War inevitable.

Part II of the story of Eli Whitney starts on page 239.

Dolphins can hear underwater sounds from as far as 15 miles away.

Odds that someone caught shoplifting is a teenager: 50%.