

Whitney and the Cotton-Gin

by Rupert Holland

Cotton-growing has been for a long time the main industry of the Southern United States, and the exporting of cotton by that part of the country has largely fed the mills of the world. Yet in 1784 the customs officers at Liverpool seized eight bags of cotton arriving on an American vessel, claiming that so much of the raw material could not have been produced in the thirteen states. In 1793 the total export of cotton from the United States was less than ten thousand bales, but by 1860 the export was four million bales. The chief reason for this marvelous advance was the cotton-gin, for which Eli Whitney applied for a patent in 1793.

Wherever cotton grew in the South there the cotton-gin was to be found. It brought prosperity and ease and comfort, it allowed the small as well as the large owner to have his share of the profits of the markets of the world. It gave the cotton country its living, and yet Whitney struggled for years to win the slightest recognition of his claims. He wrote to Robert Fulton, "In one instance I had great difficulty in proving that the machine had been used in Georgia, although at the same moment there were three separate sets of this machinery in motion within fifty yards of the building in which the court sat, and all so near that the rattling of the wheels was distinctly heard on the steps of the court-house."

He came to the South from New England, having been born in Westborough, Worcester County, Massachusetts, December 8, 1765, educated at Yale College, and going to Georgia as teacher in a private family. General Greene, of Savannah, took a great interest in him, and taught him law. Whitney had been a good student, had an attractive personality, and had already shown a natural knack for mechanics. While he was teaching at the Greenses' home he noticed that the embroidery frame that Mrs. Greene used tore the fine threads of her work. He asked her to let him study it, and shortly had made a frame on an entirely different plan that would do the same work without injuring the threads. His hostess was delighted with it, and spread the word of her young teacher's ingenuity through the neighborhood.

As in all Southern mansions hospitality was rife at the Greenses', and it happened that one evening a number of gentlemen were gathered there who had fought under the General in the Revolution. The subject of the growing of cotton came under discussion, and some one spoke of the unfortunate fact that no method had been found for cleaning the cotton staple of the green seed. If that could be done cotton could be grown with profit on all the land that was unsuited for rice. To separate a single pound of the clean staple from the green seed took a whole day's work for a woman. There was little profit in trying to grow much cotton at such a rate, and most of the cotton picking was done by the negroes in the evenings, when the harder labor of the fields was finished. Then Mrs. Greene pointed to Eli Whitney with a smile. "There, gentlemen," said she, "apply to my friend Mr. Whitney for your device. He can make anything." The guests looked at the young man, but he hastened to disclaim any such abilities, and said that he had never even seen cotton-seed.

But in spite of his disclaimer he began to consider whether he could make a machine that would help to separate the seed from the cotton. He went to see a neighbor, Phineas Miller, and talked over his plans with him. Miller became interested, and gave him a room in his house where he might carry on his experiments. He had to use very primitive implements, making his own tools and drawing his own wire. He worked quietly, only Mr. Miller and Mrs. Greene knowing what he was doing.

Whitney worked on his machine all the winter of 1793, and by spring it was far enough completed to assure him of success. Mr. Miller, who was a lawyer with a taste for mechanics, and who was, again like Eli Whitney, a New Englander and graduate of Yale, married Mrs. Greene after the General's death. It was he who actually made Whitney's machine a business possibility by proposing that he should become a partner with the inventor, and bear all the expenses of manufacturing it until they should secure their patent. They drew up a legal agreement to this effect, dated May 27, 1793, and stipulating that all the profits should be equally divided between them.

There followed very soon the first dramatic scenes in the long battle between the owners of the cotton-gin and the public. The Southern people knew how invaluable such an invention would be to them; it meant food and shelter and better living all along the line; it would increase the value of their property a hundredfold. So as soon as it became bruited abroad that Eli Whitney had such a machine in his workroom that spot became the Mecca for the countryside. Crowds came to beg for a look at the wonderful machine, and hung about the house and plotted to get in. But Whitney and Miller were afraid to let people see the invention until they had made sure of their patents on it, and so they refused to let the crowds have a look at it. Then the more reckless of the crowds threw all sense of fairness to the winds, and broke into Mr. Miller's house, seized the machine, and carried it off with them. Soon it was publicly displayed, and before Whitney could finish his model for the Patent Office a dozen machines, similar to his, were in use in the cotton fields.

Whitney's cotton-gin was made of two cylinders of different diameters, mounted in a strong wooden frame. One cylinder had a number of small circular saws that were fitted into grooves cut into the cylinder. The other cylinder was covered with brushes, and so placed that the tips of the bristles of these brushes touched the saw-teeth. The raw cotton was put in a hopper, where it was met by the teeth of the saws, and torn from the seeds. The brushes then swept the cotton clear of the gin. The seeds were too large to go between the bars through which the series of saws protruded, and were kept apart by themselves. Of course many improvements were made upon this machine, but it was found that even in this original form it would enable one man, using two horse-power, to clean the seed from five thousand pounds of cotton in a day. That meant that fortunes could be made in the hitherto disregarded cotton fields of the South.

Whitney now went to Connecticut to finish certain improvements on the machine, to secure his patents, and to begin the manufacturing of as many gins as his partner Miller should find were needed in Georgia. The partners' wrote frequently to each other, and their letters show the fierceness of the struggle they were waging to protect their rights. "It will be necessary," wrote Miller, "to have a considerable number of gins in readiness to send out as soon as the patent is obtained in order to satisfy the absolute demands and make people's heads easy on the subject; for I am informed of two other claimants for the honor of the invention of the cotton-gin in addition to those we knew before."

The two men did everything in their power to hasten the building of their gins. They knew their rivals were unscrupulous, and were in fact already trying their best to prejudice the minds of the more conservative Georgia cotton-growers against them. But money was very scarce, and the manufacture of the machines proved so costly that Whitney found it impossible to furnish as many gins as his partner wanted.

Whitney applied for his patent in 1793. The following April he went back to Georgia, where he found unusually large crops of cotton had been planted, in expectation of using the gin. As there were not enough of his gins ready rivals were pushing their inferior machines. One of these, called the roller-

gin, destroyed the seeds by crushing them between two revolving cylinders, instead of separating them by teeth. A large part of the crushed seed was, however, apt to stay in the cotton after it had passed through the machine, and this form of gin did not therefore produce as satisfactory results as did Whitney's. Another rival was the saw-gin, which was almost identical with Whitney's gin, except that the saw-teeth were cut in circular rings of iron instead of being made of wire. This machine infringed the partners' patents, and caused them an almost endless series of expensive lawsuits.

Two years of conflict in the South proved the superiority of Whitney's invention over all other machines, but resulted in little actual profit. In March, 1795, he went north to New York, where he was kept for several weeks by illness. When he got back to his factory in New Haven he found that fire had wiped out his workshop, together with all his gins and papers. He was \$4,000 in debt, and virtually bankrupt. Yet he had great courage, and fortunately his partner Miller had the same faith. When Whitney sent him the news from New Haven, Miller replied, "I think we ought to meet such events with equanimity. We have been pursuing a valuable object by honorable means, and I trust that all our measures have been such as reason and virtue must justify. It has pleased Providence to postpone the attainment of this object. In the midst of the reflections which your story has suggested, and with feelings keenly awake to the heavy, the extensive injury we have sustained, I feel a secret joy and satisfaction that you possess a mind in this respect similar to my own—that you are not disheartened, that you do not relinquish the pursuit, and that you will persevere, and endeavor, at all events, to attain the main object. This is exactly consonant to my own determinations. I will devote all my time, all my thoughts, all my exertions, and all the money I can earn or borrow to encompass and complete the business we have undertaken; and if fortune should, by any future disaster, deny us the boon we ask, we will at least deserve it. It shall never be said that we have lost an object which a little perseverance could have attained. I think, indeed, it will be very extraordinary if two young men in the prime of life, with some share of ingenuity, and with a little knowledge of the world, a great deal of industry, and a considerable command of property, should not be able to sustain such a stroke of misfortune as this, heavy as it is."

Whitney attempted to rebuild his factory, but the affairs of the firm were in extreme jeopardy. He had to pay twelve per cent. a year to borrow money for his work. Then certain English manufacturers reported that the cotton that was cleaned by Whitney's gin was not of good quality. The struggle was a hard one. He wrote to Miller, "The extreme embarrassments which have been for a long time accumulating upon me are now become so great that it will be impossible for me to struggle against them many days longer. It has required my utmost exertions to exist without making the least progress in our business. I have labored hard against the strong current of disappointment which has been threatening to carry us down the cataract, but I have labored with a shattered oar and struggled in vain, unless some speedy relief is obtained.... Life is but short at best, and six or seven years out of the midst of it is to him who makes it an immense sacrifice. My most unremitting attention has been devoted to our business. I have sacrificed to it other objects from which, before this time, I might certainly have gained \$20,000 or \$30,000. My whole prospects have been embarked in it, with the expectation that I should before this time have realized something from it."

Pirates now filled the field, and the lawsuits which they were compelled to bring to defend themselves went against them. Miller wrote to Whitney on May 11, 1797, "The event of the first patent suit, after all our exertions made in such a variety of ways, has gone against us. The preposterous custom of trying civil causes of this intricacy and magnitude by a common jury, together with the imperfection of the patent law, frustrated all our views, and disappointed expectations which had become very sanguine. The tide of popular opinion was running in our favor, the judge was well disposed toward us, and many decided friends were with us, who adhered firmly to our cause and

interests. The judge gave a charge to the jury pointedly in our favor; after which the defendant himself told an acquaintance of his that he would give \$2,000 to be free from the verdict, and yet the jury gave it against us, after a consultation of about an hour. And having made the verdict general, no appeal would lie.

“On Monday morning, when the verdict was rendered, we applied for a new trial, but the judge refused it to us on the ground that the jury might have made up their opinion on the defect of the law, which makes an aggression consist of making, devising, and using or selling; whereas we could only charge the defendant with using.

“Thus, after four years of assiduous labor, fatigue, and difficulty, are we again set afloat by a new and most unexpected obstacle. Our hopes of success are now removed to a period still more distant than before, while our expenses are realized beyond all controversy.”

The failure of that patent suit loosed all the pirates, and Whitney saw the cotton fields flooded with gins, all of which were really based on his invention, and yet from which he did not receive one penny. The public had given over paying any attention to his patents. Every one seemed determined that a machine which meant so much to the cotton lands should be free to all, irrespective of any legal or moral rights in the matter. Miller wrote him a little later, “The prospect of making anything by ginning in this state is at an end. Surreptitious gins are erected in every part of the country, and the jurymen at Augusta have come to an understanding among themselves that they will never give a cause in our favor, let the merits of the case be as they may.”

Affairs could not well have been worse for the partners. They would have been willing to give up making gins and devote themselves to selling the rights they had already obtained, but it was difficult to find purchasers for titles which were so openly disregarded on every hand. They found it almost impossible to collect payments for the few machines they did sell, the buyers preferring to be sued, trusting to a jury of their neighbors deciding for them against the unpopular manufacturers, who claimed to control such an important machine as the gin. Whitney tried to sell his patent rights for South Carolina to that state itself, and had the matter brought before the Legislature. It met with better success than usual. “I have been at this place,” he writes in a letter, “a little more than two weeks attending the Legislature. A few hours previous to their adjournment they voted to purchase for the state of South Carolina my patent-right to the machine for cleaning cotton at \$50,000, of which sum \$20,000 is to be paid in hand, and the remainder in three annual payments of \$10,000 each.” To this he added, “We get but a song for it in comparison with the worth of the thing, but it is securing something. It will enable Miller & Whitney to pay their debts and divide something between them.”

This plan of selling the rights to the states seemed to promise better things for the inventor. In December, 1802, he arranged for the sale of similar rights to the state of North Carolina, and a little later a similar agreement was made with Tennessee. But imagine his dismay when the South Carolina Legislature suddenly annulled its contract with him, refused to make any further payments, and began suit to recover what had already been paid him. The current of popular opinion had again set against this firm of two. It was said that a man in Switzerland had invented a cotton-gin before Whitney, and that the main features of his own machine had been taken from others. But there were some upright and honorable men in the South Carolina Legislature, and they finally succeeded in convincing their associates that Whitney had been maligned. In the session of 1804 the Legislature rescinded its latest act in regard to the gin, and testified to its high opinion of Whitney.

The inventor’s faithful partner, Miller, died in 1803. He had stood by Whitney through thick and

thin, and had met one buffet after another. In spite of his splendid spirit the ceaseless war to protect their claims had somewhat broken him, and he had despaired of ever receiving justice in the courts. Whitney himself was now receiving some return from the sales to the states, and these enabled him to keep out of debt, but the greater part of his earnings had still to go for the costs of his suits at law.

In December, 1807, the United States Court in Georgia gave a decision in Whitney's favor against a man named Fort who had infringed on his patent. The words of Judge Johnson in this case became celebrated. "To support the originality of the invention," said he, "the complainants have produced a variety of depositions of witnesses, examined under commission, whose examinations expressly prove the origin, progress, and completion of the machine of Whitney, one of the copartners. Persons who were made privy to his first discovery testify to the several experiments which he made in their presence before he ventured to expose his invention to the scrutiny of the public eye. But it is not necessary to resort to such testimony to maintain this point. The jealousy of the artist to maintain that reputation, which his ingenuity has justly acquired, has urged him to unnecessary pains on this subject. There are circumstances in the knowledge of all mankind which prove the originality of this invention more satisfactorily to the mind than the direct testimony of a host of witnesses. The cotton-plant furnished clothing to mankind before the age of Herodotus. The green seed is a species much more productive than the black, and by nature adapted to a much greater variety of climate, but by reason of the strong adherence of the fibre to the seed, without the aid of some more powerful machine for separating it than any formerly known among us, the cultivation of it would never have been made an object. The machine of which Mr. Whitney claims the invention so facilitates the preparation of this species for use that the cultivation of it has suddenly become an object of infinitely greater national importance than that of the other species ever can be. Is it, then, to be imagined that if this machine had been before discovered, the use of it would ever have been lost, or could have been confined to any tract or country left unexplored by commercial enterprise? But it is unnecessary to remark further upon this subject. A number of years have elapsed since Mr. Whitney took out his patent, and no one has produced or pretended to prove the existence of a machine of similar construction or use.

"With regard to the utility of this discovery the court would deem it a waste of time to dwell long upon this topic. Is there a man who hears us who has not experienced its utility? The whole interior of the Southern states was languishing and its inhabitants emigrating for want of some object to engage their attention and employ their industry, when the invention of this machine at once opened views to them which set the whole country in active motion. From childhood to age it has presented to us a lucrative employment. Our debts have been paid off, our capitals have increased, and our lands trebled themselves in value. We cannot express the weight of the obligation which the country owes to this invention. The extent of it cannot now be seen. Some faint presentiment may be formed from the reflection that cotton is rapidly supplanting wool, flax, silk, and even furs in manufactures, and may one day profitably supply the use of specie in our East India trade. Our sister states also participate in the benefits of this invention, for besides affording the raw material for their manufacturers, the bulkiness and quantity of the article afford a valuable employment for their shipping."

Whitney had fought long and hard, and had at last received at least partial justice. But it had been so slow in coming that, when his rights were to a certain extent established, there were only a few years left his patents to run. He had realized for some time that he must look elsewhere for financial returns, and so, in 1798, had begun the manufacture of firearms. He purchased a site for his factory near New Haven, at a place called Whitneyville now, then known as East Rock. Oliver Wolcott, Secretary of the Treasury, ordered 10,000 stand of arms from him, and he contracted to furnish them. At first he met with many difficulties, owing to lack of proper materials and workmen, and his own lack of familiarity with the business. But as time went on the works improved, and Whitney applied his

inventive genius to many important improvements. He received other contracts, and eventually the national government came to rely upon his factory for a large part of its war supplies.

In 1812 Whitney applied for a renewal of his patent for the cotton-gin. He set forth the facts that he had received almost no compensation for his invention, that it had made the fortune of many of the Southern states, that it enabled one man to do the work of a thousand men before, but that, placing the value of one man's labor at twenty cents a day, the whole amount he had received was less than the value of the labor saved in one hour by the use of his machines throughout the country. But again there was opposition from many influential Southern planters, and his application was denied.

The inventor was, however, making money from his factory for firearms, and his personal fortunes had brightened. In 1817 he married Henrietta Edwards, the daughter of Judge Pierpont Edwards, of Connecticut. His home life was ideally happy, he was fond of New Haven, and eventually he received increasing evidence that the people of the cotton lands were learning their indebtedness to him, and were anxious to make some restitution for their earlier disregard of his claims. He died January 8, 1825.

The material value of Eli Whitney's invention can hardly be estimated. It opened a new kingdom to the South. It built up countless acres of hitherto unprofitable land. But in spite of men's recognition of the value of his cotton-gin, and their instant adoption of it everywhere, he was for years denied his title to it, and had to wage a warfare that is almost without parallel in the history of American inventors.

Source:

Holland, Rupert. "Whitney and the Cotton-gin." *Historic Inventions*. Philadelphia: George W. Jacobs & Company, 1911. 96 – 110. Electronic.