I have now growing a variety of hybrid cotton, a sample of which I send you. It is perennial in Fiji, grows to a height of 14 feet in good soil, and, if cultivated, bears for many years without replanting. The yield from this variety is very much in excess of any kind with which I am acquainted. The cotton does not stain with wet as does the Sea Island variety, and the seed comes away readily from the lint, thus rendering the whole of the lint available for manufacture, and leaving the seed more valuable for oil purposes. The climate of Fiji is most equable, and in no respect unfitted for the residence of Europeans. . . Every kind of cotton grows well here."

THE FELTING PROPERTY IN WOOL.

As a manufacturer, I gave the felting property in wool but little consideration, except in a general sense, and learned to know the felting property by comparison and experience only, which is quite a different thing from considering the individual fibre, the only way to properly study wool. The fact that wool would felt was known before the art of carding and spinning was discovered. To felt wool requires heat, moisture and motion, all of which would be supplied by weaving wool near the human body. It is one thing to know that wool will felt, and quite another thing to know why and how it will felt. It was about the year 1795 or earlier, that M. Monge, a French savant, discovered what he was pleased to call "serrations" on the surface of the fibre of wool, and stated his belief that it was the interlocking of these "serrations" during the motion made by the fulling mill that caused the action of felting. This has been accepted by manufacturers, microscopists and others who have given the felting property any consideration. While editing the "Boston Journal of Commerce," the mysterious felting property in wool forced itself on my mind continually. That the reason given was not correct was apparent to me, and some good articles were the result, containing valuable facts which manufacturers should have treasured up. During the year 1883 to 1884, the principle of felting was revealed to me, and contrary to my usual custom, I did not make this public at the time, but determined to keep it a few years and see if the microscopists, who were making a big stir at that time, would not stumble upon it. The late A. Spitzli was then president of a microscopical society with headquarters in Boston and another in New York. To give them a better chance, I wrote an article and did all but make the fact public, still it remained undiscovered by them. Sometime during 1884, Colonel C. W. Jencks called at my office and I stated to him my discovery. In the "Rural World," for August 4th, 1884, in an article under the head of "The Angora Goat," I found the following statement: "Within ten days I have made in connection with it (mohair), the important discovery that part of the fibre will felt and part of the same fibre will not felt." This is another illustration, warning inventors to keep their own counsel and not place too much confidence in friends. The late Dr. John L. Hayes, secretary of the National Association of Woolen Manufacturers, in reproducing one of my articles in the Bulletin, commented on it as follows (I quote from memory): "Then it appears that there is something in the felting property of wool yet undiscovered. Can it be that the fibre felts within itself?" Even this did not open the eyes of the "wiseacres" of that day, and I have allowed the matter to rest until now. Being a descendant of a race of broadcloth manufacturers, and having in boyhood followed every detail of the business as an observer, and being blessed with a good memory and reasoning faculties, there is little about this business that I do not remember. All manufacturers know that when wool gets fast to a steam pipe in a dye kettle, and is left there while the water is boiling, it will felt, while the loose wool in the kettle will not felt. The wool, being held fast, is moved violently in the water, hence there is heat, moisture and motion, and felted wool is the result. The best felting wools do not have the serrations as defined by M. Monge, and those who have followed in his track, accepting his errors, have done little thinking and investigating. For the past one hundred years the theory had been accepted that the fibres interlocked in fulling and that the saw-tooth-like serrations caught hold of each other and in this manner felted. It must be remembered that while this is going on the fibre is rendered limpid by hot soap and the high temperature generated in the mills. Let any manufacturer put theory aside and bring practical, common sense to bear, especially when making a thirty-two ounce kersey out of Australian wool, and he will find that it is simply impossible for fibres of wool to work their way into each other, to any great extent, producing felted cloth. Let those who have any faith in the old theory take a single fibre of Australian wool and try to force it into cold water even, let alone into a piece of heavy beaver, when softened by hot soap and a high temperature in the mill. The whole theory is too absurd for a moment's consideration. When the discovery came to me I took two locks of mohair, or very coarse wool, and sent one to Capt. T. J. Rigney, then finisher at the Taconic Mill, Pittsfield, Mass.; the other I sent to O. F. Ireland, then finisher at Goff's Falls, N.H. These locks of wool were put into the mills and fulled with the cloth. On the return of these two samples the discovery was confirmed. They came to me in precisely the condition I expected, and I was satisfied. To make myself better understood, let us suppose a good, healthy merino sheep, newly clipped, on which we will put a coat closely fitting over the whole body, and in this way grow the fleece without light ever shining upon it. This would produce a perfect felting fleece and leave no loose, badly colored hairs on the face of fine kersey cloth, but would handle like a board. On the contrary, let us take a long wooled English sheep, the fleece grown in full daylight, exposed to the sun at all times, and it would be impossible to felt it, except the small portion from No. 1 to No. 2 on plate one. This portion would felt because grown in the dark, i.e., covered by overlapping locks. We are told that "extract" will not felt because the acid used in carbonizing has eaten off the serrations. This is also erroneous theory. The fact is, the acid hardens the wool fibre so that it cannot shrink within itself; hence there is no felting. This hint should be valuable to flannel manufacturers. Where the light shines on the side of the locks on the sheep's back, the wool will not felt, or but imperfectly, in proportion as it is exposed. It is well known that merino wool is only exposed to the sun at the tip or end of the fibre, as the fibres are held together by the yolk which grows with all merino wool. Where there is yolk there is felting property, because the fibre is kept in an unhardened, gelatinous state, proper for felting, and not a hairlike fibre as in Eng-

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