

form the metal into a hoop, which is finished by heating and rolling. Arrangements are being made for making Bessemer tires in the same manner, and it is not unlikely that, the risk of broken welds being thus removed, they will take the place of all tires now in use.

PLATE GIRDERS.

We believe some small plate girders of Bessemer steel have been constructed, but its advantages would appear chiefly in large spans, where, in the case of iron, the weight of the bridge itself forms the greater part of its own load. For ordinary spans the present price of Bessemer steel leaves no margin of advantage to the engineer. It is known, however, that it is being learned how to turn the commoner kinds of English iron to good account in the Bessemer process, and as the waste in manufacture is very little and as a great number of firms are now competing in the business, it is in all respects probable that Bessemer metal will fall rapidly in price, and that its use will be as rapidly extended.

OUR SPECIAL CORRESPONDENCE.

The center of the cotton manufacture. Enormous profits of the business. Prosperity during the war. Curious effects on the business of our inflated currency. Work being resumed. Prosperity of other manufactures.

PROVIDENCE, April 22, 1865.

MESSRS. EDITORS:—This is the center of the manufacturing interest of New England. On the beautiful heights in the eastern part of the city are noble residences of the Spragues, the Browns, the Iveses, and many others whose villages are scattered along the valleys of this and the adjoining States, and who have made colossal fortunes by spinning, weaving, bleaching, or printing the white *ala* of the *goesypium herbaceum*, and thus fitting it for clothing the backs and limbs of men and women.

One establishment that I happen to know about, which has a capital of \$200,000, made last year a gross profit of \$97,000, and after reserving \$27,000, they divide \$60,000, which is a net profit of 30 per cent. This is, however, better than the average for the last year, as the decline in cotton from \$1 80 to 25 cents per pound has in some cases swallowed up the whole, and in others, a large portion of the profits. But the cotton manufacture has never known a more prosperous period than during this war.

I was very much interested in the details of the embarrassment to this industry, as to all others, from the fluctuations resulting from our inflated currency. A large manufacturer was asked the present cost of making a yard of 60×64 print cloths, besides the cost of the cotton. He replied about 3 cents, just double the cost under the old specie currency. He explained that wages are about 50 per cent higher, coal, freights and supplies generally about double, carrying the cost up to about 2½ cents, and the remaining half cent is caused by the uncertainties and fluctuations in the business. For instance, two months ago he decided on the rapid fall in cotton to stop buying, and to work up all he had on hand; consequently the beams were filled first with 30 yards of yarn, then with 20 yards, and then with 15 yards, thus making the expense of "drawing in" the same for half a piece as for a whole piece when the mill was running full time. Furthermore, the expense of superintendence, clerk hire and many other departments is no more with a full product than with half product. In short, there are innumerable ways in which the uncertainties and embarrassments resulting from a fluctuating currency operate to diminish the production of wealth, in this, and in all other branches of the national industry.

The present comparatively low price of cotton has produced a common feeling that it will not probably fall much more at present, and a good many mills that have been suspended are resuming operations. There is a general feeling, however, that it is very much of a speculative, gambling transaction, rather than a safe, steady and substantial business.

The iron, steam engine, machine making, and other manufactures generally are very profitable, and the city is accumulating wealth with great rapidity. I have just been through one of the large manufactories of cheap jewelry, but will reserve an account of that for my next communication. B.



Northern Cotton.

MESSRS. EDITORS:—By an act of Congress, public attention has been attracted to the mode of preparing flax and hemp as a substitute for cotton. Those engaged in the experiment of these fibers are sanguine of success. Owing to the scarcity of the staple resulting from the war, the culture of cotton has been attempted in the States of Kansas and Missouri, and other States as far north as the 40th degree of north latitude, which seems to be the northern boundary of King Cotton, beyond which Nature has forbidden his jurisdiction on the American continent. This parallel appears to be also the southern boundary prescribed by nature in America for the growth of a plant which has many, if not all, of the characteristics of the cotton plant, viz., *Epilobium*, and which, according to the books, is indigenous as far south as Pennsylvania, and as far north as the arctic circle.

In the month of October last I collected a small quantity of the plants of the common fire-weed. The plant proved to be *Epilobium*, and in compliance with a request of the Agricultural Department at Washington, I have made certain experiments which it may be interesting to your readers and to the public to have submitted to them.

My first utilization of the fiber was the simple operation of picking it from the pod in which it grew, and placing it in the tube of a common oil lamp—forming a wick by twisting it with my fingers; it answers every purpose of wicking for which we have been paying from seven to ten dollars per pound.

Encouraged by this success, I resolved to ascertain whether it would spin, and the result was a stocking, which was carded, spun, knit and dyed by the same tiny hand that picked the fiber from the pod in which it grew. Next I had made a flat wick for the rotary burner used in kerosene lamps, which was equally successful in its operation; then a braided wick for a sperm candle, and a common strand wick for a tallow candle. For the purpose of testing the strength of the fiber, I took the braided wick to a shop, and lifted first a seven, then a fourteen pound weight, and then both together, without any symptoms of breaking. Furthermore, I had made a cord, about the size of a common clothes-line, which did not break till I put two fifty-pound weights upon it. The wicking was saturated with sperm oil; the cord was not saturated, but entirely dry, and twisted by hand, after the fiber had been spun into strands, on an old-fashioned large spinning wheel. The fiber was carded by hand, on cards of number 32 wire. Mixed with one-fourth wool or cotton fiber, the yarn can hardly be distinguished from woolen or cotton yarn, but I have not enough of the material to weave it, and of course know nothing upon that branch of the case. The woman who spun it said that it was much better than yarn she had worked in a cotton factory. A manufacturer of under-shirts and drawers (mixed half and half) has promised to try it next fall.

That it will make wadding, batting, etc., is conceded by the manufacturers of those articles, and an extensive paper manufacturer pronounced it the best material (except silk) he ever saw for fine paper. The fiber measures from three to six-eighths of an inch in length; the former grew on dry, sandy loam, the latter on moist ground near a spring of water.

Dr. Copman, of Utica, who is considered a very cautious observer, certifies, after careful examination and comparison under his glass, that the fiber of the *Epilobium* has all the characteristics of the cotton fiber, and is a very different substance from the fiber of the milk-weed, which was compared at the same time with both the cotton and *Epilobium* fiber.

RUTGER B. MILLER.

Utica, April 4, 1865.

Petroleum in Chemung Valley.

MESSRS. EDITORS:—I am a reader of your valuable paper, and among the quantities of good reading I occasionally see an article on petroleum oil, and I write this letter to communicate something upon that subject. We have discovered petroleum in the Chemung Valley. It has been found all along the

Chemung Canal, and in the Valley clear to the head of Seneca Lake. I myself have skimmed quantities of it off the water, and will send you a sample if you would like to see it. Others have done the same thing, and the people of Havana and Watkins are now in a blaze of excitement upon the subject. The oil is of the best quality, as many will tell you who have gathered bottles of it. The existence of the oil has only lately become generally known, but last week it was discovered oozing out of the ground in large quantities in different places. Some geologists and chemists have examined it, and say the whole valley is filled with oil. I send you this letter thinking the information may be worth publishing in your valuable journal, of which I am a constant reader.

W. J. CRANDELL.

Millport, April 24, 1865.

Saleratus and the Teeth.

MESSRS. EDITORS:—In the last number of the SCIENTIFIC AMERICAN I notice an extract from the correspondence of the *Dental Quarterly* in regard to the effects of saleratus and cream of tartar upon the teeth. The publication of such ideas as we find expressed therein for a long time, in all kinds of journals, has resulted in disseminating among the people erroneous ideas in regard to their teeth, and has increased the labor of dentists exceedingly, thus showing their baneful effects. If the people generally had clear ideas of the simple nature of decay of their teeth, the trouble and expense of keeping them in good condition would be exceedingly lessened. Hence one who understands why teeth go to ruin and cause so much misery in life must feel as if the short extract in question must go still further to mystify the public. This simple subject should have one thorough ventilation in the public journals to solve the difficulties and wonders of many minds in this respect, and set the people to thinking rightly, instead of catching up here and there little absurd notions, which only have the effect to mislead and injure them.

The enlightened labors of Dr. Amos Westcott, one of our leading dentists, have settled to a certainty the cause of caries of the teeth, and his experiments have been so thoroughly conducted and so generally recorded in standard works on dentistry, that if any dentist has of late felt that there is a mystery about the decay of teeth, he shows that he cannot have studied any standard work in dentistry, and hence is unfit to advise the public in dental matters. Saleratus is an alkali, and cream of tartar is an acid, and the correspondent says:—"Saleratus removes the gelatine, the cream of tartar removes the lime—the two principal ingredients of the teeth—and between the two evils the teeth stand a poor chance, and hence the result." The experiment of the correspondent conflicts with Dr. Westcott's experiment with saleratus and teeth, for on page 286 of Harris's "Principles and Practice of Dental Surgery," the main work extant in dentistry, we find among the results of Dr. Westcott's experiments the following recorded:—"Alkalies do not act upon the enamel of teeth; the caustic potash acts readily upon the bone of the teeth by uniting with its animal matter." Why? Because in the enamel less than one in one hundred parts consists of animal matter, while in the bone twenty-eight parts in one hundred are gelatine and water. In the enamel ninety-nine parts consist of lime, magnesia and soda. Although the two results are differently recorded, we must give preference to that of Dr. Westcott, for it has the stamp of authority and consistency and relative facts, which show great sagacity and education, while all we have to do to demonstrate the lack of penetration and information of the Portsmouth correspondent is to consider what has escaped his notice, although I dare say any woman could have told it to him, viz., that of all this 32 tons of saleratus and cream of tartar dispensed to the 10,000 people of Portsmouth in a year, to the ruin of their teeth, not one ounce ever came in contact with a sane person's teeth until after the two articles had been combined in cooking so as to form tartrate of potash, a neutral salt, or the bitartrate and carbonic acid gas, which are two totally different articles from either cream of tartar or saleratus, and absolutely harmless to the teeth practically. Suffice it to say that the only cause of the decay of the teeth is contact with acids, which arise either by the taking