

AMERICAN STEEL.

We have frequently urged upon our metallurgists and iron manufacturers the importance of engaging in the production of steel to supply all our wants in the arts. Success has attended the efforts of several parties who have engaged in the manufacture of steel west of the Alleghanies, and we see no reason to doubt that similar success would attend like efforts in other parts of our country. In Pittsburgh there are several establishments in which steel is made, and it has taken the place of coarse English and German steel which had been used in the fabrication of the cheaper sorts of implements and tools. The Pittsburgh steel is equal in quality to the same foreign grades, while its cost is less, hence its use is becoming very general in the West. All the finer sorts of steel, however, are still imported in great quantities from England; also much of the more common qualities for the Eastern sections of our country. Now, it appears to us that all the steel we require could and should be manufactured on this side of the Atlantic. We have all the necessary natural elements for producing every quality of it. The best English steel is not made from native iron but from imported Swedish and Russian brands. Long experience and acquired skill with cheap fuel are the advantages which have made England the steel manufactory of the world. In several sections of the United States there are unlimited supplies of the same ores as those of Sweden, and fuel is more abundant than in Great Britain. The very best qualities of steel can be made here from native ores, and it only wants enterprise, capital and skill to establish and conduct the manufacture of fine American steel with success. There are many inducements for entering upon this business at present. The tariff is a premium to capital and industry, and the steel trade is not like an ephemeral business that changes with the fashions; it is as fixed as the very hills.

This has been called "the age of iron," and the next will be "the age of steel," because steel is yet destined, from its very nature, to supersede iron in a thousand various applications. It is much stronger than iron, and for several purposes it is far more durable. Its greater cost has been one of the main reasons for its more limited application, but improvements in its manufacture will yet be made so that it will be produced at cheaper rates, and then it will be more generally used. Already steel axles and tires for locomotives have superseded, in a measure, those formerly made of wrought iron; and when steel can be made and forged in large masses it will be employed for all the large shafts and working parts of marine and other engines. If steel could be produced at \$100 per ton, capable of bearing a strain of forty tons on the inch, bridges double the span of those made of iron would be erected.

For all machines and structures where welding is not required, steel is far superior to wrought iron. We import all the steel for manufacturing our wire, saws, axes and fine tools of every description. These are permanent applications of this metal for which it will always be used; but, beside these, new applications of steel are being made constantly. Thus several tracks of steel rails have been laid in England, and these have now been tested for about four years with the gratifying result that they are about as good to-day as when laid down, and they last as long as three sets of iron rails. It is probable that all the railway lines in the world will yet be laid with steel rails. Just think of fifty thousand miles of railway in America yet to be furnished with steel rails. Their first cost is greater but they are the cheapest rails in "the long run." English and French civil engineers are now advocating their use, and their general application cannot be long delayed. A very flattering prospect, we think, is presented to those who early engage in the manufacture of American steel.

NEW STEAM PASSENGER CARS.

We have frequently advocated the employment of steam as the motive-power of common passenger cars for city railroads, because a steam car is as easily controlled as one drawn by horses, and it is therefore equally as safe while it is far more economical. A combined steam and passenger car for short lines of

railway, to obviate the use of a separate locomotive drawing a train, we have also spoken favorably of. Such a car we illustrated and described on page 257, Vol. V (new series), of the SCIENTIFIC AMERICAN, on which occasion we said; "The time is not far distant when passenger cars combining the engine will become general on most of our small railroads." We now chronicle the adoption and employment of three such cars on the Jersey City and Bergen Point Railroad—a line about four miles in length. Each car is 26 feet 9 inches in extreme length and 7 feet 9 inches in width. The seats extend along the sides, leaving a wide space in the middle, and it is heated by steam pipes running under the center of the floor. At the front end the engine room is partitioned off from the passenger apartment. The machinery, consisting of two small inverted cylinders, each 5½ inches in diameter and 10 inches stroke, is yoked to the pinion that gears into the driving wheel, and the tubular boiler, 27 inches in diameter, is situated at the other side of the engine-room, leaving an ample middle space between for the engineer and brakeman. The water tank is underneath the seats, and thus all the mechanism, boiler and adjuncts, are compacted in a very small space. An improved truck enables the car to turn curves of 60 feet with ease, although the wheels are situated 13 feet apart. At Bergen Hill the grade is about 200 feet, yet this steam car ascends it easily, and upon a level it can run at the rate of 16 miles an hour. A trip in one of these cars has satisfied us that in style of finish, comfort and cleanliness, this system is a great improvement over any of the horse-railroad cars in this or any other city, and the managers of the Jersey City and Bergen Point Railroad deserve credit for enterprise in having adopted them.

MILK.

We have a vivid recollection of seeing, during the early years of life, the maids returning from the farm-yard, in the cool gray twilight of the summer evening, bearing foaming pails of milk warm from the cow; this pastoral scene has been renewed in our mind at various intervals, when we have been so fortunate as to secure a few days in the country. There is a popular tradition in the mind of our citizens that the substance which is delivered to them, matutinally, is a legitimate product of the cow, that it is unalloyed, and is what it purports to be—milk. Alas! what delusions are these! the most consumptive, asthmatical, lop-horned female of the herd would disdain to own such a thin and watery dilution of the early beverage of childhood as is daily sold in the streets of this city. Once, and not long ago either, our dead walls and fences were covered with flaming placards which denounced all dealers of swill milk, and diluters of the same (think of it, ye bovines—diluted swill milk!) to be guilty of a penal offence, for which, upon conviction, they should be punished. The police were appointed inspectors of the milk stands, and had authority to bring to trial any one whom they suspected of transgressing the law; and we fondly hoped that the day was at hand when swill milk and its allies would be stricken out forever from the long list of abuses which are suffered, unchecked, to override us. At first all went well, and a few unhappy Dutchmen were brought to trial, suffered the painful ordeal of an exposure to the public gaze, were fined fifty dollars and let loose from justice, only to sell swill milk with renewed assiduity and without loss of time. How could they otherwise recover that portion of their gains which had been taken from them? And so the farce goes on; the public are daily served with a modicum of a bluish-whity fluid, an analysis of which we dare not attempt; it might be used advantageously on washing day for clearing linen, but it certainly is not fit to be put in the human stomach.

It is estimated that the entire milk crop of the United States, for the year 1862, reached \$160,000,000. New York State produces as much milk (and water) as all the New England States, together with New Jersey, Delaware and Maryland. It would seem that with all this expenditure, and at the price demanded—six cents a quart—we might have the beverage for which we ask in vain. It would be unjust to say that no pure milk comes to this city, but it is a hereditary and an inherent vice of milkmen to dilute their milk most lavishly; doubtless they fear

that in its natural state it would be too rich for the stomach, and hence their liberality in the article of water.

THE COMBINATION OF PAPER-MAKERS.

The recent increase in the price of printing paper has created no small excitement in the business community. By the conjoint action of the paper-makers at a meeting held by them, last fall, at the Astor House, in this city, it was then and there recommended that the prices of paper be forthwith increased to certain fixed rates. This recommendation was adopted; and before the sun rose again, the prices of paper were, by a singular unanimity on the part of the manufacturers, raised exorbitantly. This proceeding drew the attention of the public to the material for paper-making; and by a natural sequence it entered into speculation, which imparted a fictitious value to rags, waste paper and crude material of all kinds. The result of this raid and research among musty old documents and rag bags was an immense quantity of paper stock, which it was fondly hoped and indeed emphatically asserted would reduce the price of printing-paper, at least, to moderate figures, or to rates in some way corresponding to the condition of the currency. Unfortunately, however, this anticipation was not realized; the market became overstocked with refuse paper; the price of rags fell and substitutes for cotton, of one kind and another, were proposed and many of them employed. Notwithstanding all these occurrences the prices of paper remain as high as ever, and the association of paper-makers declare that the charges that are made of combination among them to sustain prices are unfounded. They turn the point of the assertion, by a foolish quibble, upon the word "recommend," as if that in the connection had not the same significance as "resolved." If they are not united what is the need of an association among them, and why may not one or two or more individuals sell their productions at from half to one cent less per pound than the others, unless it be that there is some secret understanding mutually, the proper term for which has not yet been discovered?

There is, however, another side to the question and that is the action taken by the publishers of the country; they represent a powerful interest and are in direct opposition to the paper-makers on the subject of unjust agreement; they too, have had a meeting, and—as a foil to the combination, understanding, or what not, of the manufacturers—have petitioned Congress to repeal the duty on foreign paper, so that the necessary supplies may be obtained from abroad. Their action is again opposed by the paper-makers, who assert that this is unjust and also unpatriotic. In a bit of special pleading these gentlemen set forth the disadvantages which would result to the country at large if such a dangerous precedent as special legislation upon manufacturing interests is adopted.

We think that the prospective danger is very much overrated, and is not by any means so great as the present injury which is being inflicted through the action of the monopolists on the best interests of the people. The curtailment of the reading privileges of our community, entailed by the high price of paper, is no small hardship and one which they cannot bear patiently. The action of Congress upon the matter can be averted by the paper-makers themselves, should they see fit to throw themselves into the imminent deadly breach which they see opening in the policy of the Government upon this matter; only let them lower the price of paper to a standard which will give a fair profit on the material, time and capital involved, and our pressmen and others interested will willingly accede to the demand; they are not unreasonable and ask no sacrifices from paper-makers, and it is but fair that a similar spirit should be exhibited on the other side. We cannot see how it is that there can be no resolution or its equivalent to maintain exorbitant prices. The materials for paper-making grow in every State and can be worked up by improved processes into suitable paper. Rags are scarce, it is true; but straw is plenty, and yet straw paper is sold at prices far beyond its legitimate value. We do not wish to impeach the veracity of the gentlemen composing the association, but there are some facts which conflict so materially with their stand upon this matter that they will