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THE SCIENTIFIC AMERICAN SUPPLEMENT,

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CAST IRON MALLEABLE.

After all that has been written to define the difference between malleable iron and cast iron made malleable, there is a lack of information that requires further statements of facts. In the parlance of our English cousins, malleable iron is our "wrought iron." All wrought iron is considered malleable—capable of being spread under the hammer—but our malleable iron is brittle cast iron made capable of being bent cold, of being changed as to form by pressure or by percussion, and sometimes of being forged like real malleable, or "wrought," iron.

But cast iron can be softened without being made malleable; it is simply a process of annealing. Small articles of cast iron frequently become so chilled in the sand of the mould as to be impervious to the coaxing of the file or the persistence of the drill. In some establishments where minute iron castings are made, it is necessary to anneal them, even if they are not to be subjected to any tool processes; the attrition of the tumbling barrel would test their tenacity. As they come from the foundry, they are as brittle as unannealed glass. To anneal these brittle products, they are packed in cast iron boxes with sand—ordinary quartz sand—subjected to a red heat for about forty-eight hours, and allowed to cool gradually. There is no chemical virtue in the sand—it is merely a conservator of the heat, and the degree of heat is not sufficient to fuse the sand or to even round the corners of the sprews of the castings.

But to make cast iron malleable—to change its quality from the brittle, almost vitreous, condition of the casting to that of the almost plastic or malleable quality—requires a different treatment. The art is not modern, for as long ago as 1828 the Franklin Institute awarded a premium to Seth Boyden, of Newark, N. J., "for an assortment of buckles, bits, and other castings of annealed cast iron remarkable for smoothness and malleability." The uses of the process have been greatly extended since 1828, and its possibilities are better understood now than then. Kitchen spoons which are to be tinned are not made of wrought iron, but they are cast and made malleable. The blanks for the spoons are cast of iron, perfectly flat, giving only the outline of a spoon. These blanks are so brittle that they have to be handled like eggs in packing them for the softening process. When made malleable, and cooled, they are "struck up"—formed—in dies, and tinned or nickeled. Skate irons are produced in the same way. The irons are cast iron; then subjected to the malleable process, dressed, and finished, and case-hardened. It is claimed by some skaters that these skate irons are superior to those made of steel.

A NEW REMEDY FOR THE IMPORTED CABBAGE WORM.

Professor C. V. Riley says: "One of my correspondents, Mr. Charles H. Erwin, of Painted Post, N. Y., has accidentally hit upon so simple and yet, according to his experience, so perfect a remedy for the imported cabbage worm that I wish to give his experience as much publicity as possible, that it may be widely tested and, if possible, verified the coming season. It is, to sum up an extended experience which he narrates, simply ice cold water, or water but a few degrees warmer than ice water, sprinkled upon the worms during the heat or the day. Mr. Erwin found that such an application in the hot sun caused them to quickly let go their hold upon the leaves, curl up, roll to the ground, and die, while the cabbages suffered nothing, but looked all the fresher for the application.

Should this method prove as successful with others as it has with him, it is evident that we have here a remedy of very general application, and one which in cheapness and simplicity far transcends the Pyrethrum which, since I discovered its value for the purpose, in 1880, has been, on the whole, our safest and most satisfactory remedy against Pieris rapae. Where ice is readily obtainable, as in the more Northern States, or where cold springs obtain, Mr. Erwin's discovery will prove of very great value to cabbage growers, and will probably prove just as useful against some of the other cabbage worms."

Notice to New Subscribers.

Most subscribers to this paper and to the SCIENTIFIC AMERICAN SUPPLEMENT prefer to commence at the beginning of the year, Jan. 1, so that they may have complete volumes for binding.

Those who desire it can have the back numbers of either edition of the paper mailed to them, but unless specially ordered, new subscriptions will be entered hereafter from the time the order is received.

Bound volumes of the SCIENTIFIC AMERICAN and SCIENTIFIC AMERICAN SUPPLEMENT for 1884 may be had at this office, or obtained through news agents.

All the volumes of the SCIENTIFIC AMERICAN SUPPLEMENT from its commencement, bound or in paper covers, may be had as above.

The Worker in England and in America.

Mr. D. Pidgeon at the Society of Arts, London, lately read a paper on "Labor and Wages in America." Following in the early part of his paper somewhat closely on the lines of his recently published book, "Old World Questions and New World Answers," Mr. Pidgeon first drew attention to the radical differences which distinguish native American from alien labor, exemplifying the high condition of the former by the Lowell of forty years ago as described by Dickens, Miss Martineau, and others. He then sketched the social life of certain existing industrial towns, the "fastnesses" to which native American labor has, so to speak, been driven by immigrant operatives, who have imported into the States the lower life conditions exhibited by their class in Europe. After considering the efforts which are now being made in America by the state and by individuals to raise the status of alien labor to the levels of the past, he concluded that it was doubtful whether or not it is now rising or sinking in the social balance. Passing next to economic considerations, he stated what wages are now being paid to factory operatives in the States, their relation to the cost of subsistence, and to wages and the cost of subsistence in this country, concluding that while an English mechanic might vastly better his social condition by residence in the States, he would probably find himself little richer, in money, after paying the enhanced prices for subsistence and conforming to the higher standard of life prevalent in America. Finally, he attacked the doctrine that import duties influence wages, and showed that the movements of American and English wages during the last twenty-three years have been determined by some common cause which cannot possibly be due to the tariff, since this is operative in one of the two countries only.

Theophilus E. Sickles.

Theophilus E. Sickles died on the 2d of February, 1885, aged 62 years, after an illness resulting from inhaling the fumes produced by an explosion in one of the railroad tunnels whose construction he was superintending. In his death the railroad world loses one of its most prominent civil engineers. He was a native of Pennsylvania, and for many years had spent his summers in this State. The first railroad service which brought him into prominence was his building of the Hannibal and St. Joseph Railroad more than thirty years ago. He constructed the bridge of the Union Pacific Railroad from Omaha to Council Bluffs, the second tubular iron column structure of its kind completed in this country. He was connected with the Union Pacific Railroad as general superintendent for several years after its completion, and up to the time of his death was its consulting engineer, holding close and important relations with President Sidney Dillon. Among other notable works with which Mr. Sickles had connection either as chief or consulting engineer, were the Boston Water Works, the Croton improvement, the enlargement, of the Erie Canal, and the building of the dry dock of the Brooklyn Navy Yard. Congress made him a member of the commission which examined the mouths of the chief European rivers preliminary to the beginning of the work by Captain Eads upon the latter's system of jetties at the mouth of the Mississippi River. Work in which Mr. Sickles was engaged at the time of his death was the building of a bridge across the Arkansas River at Little Rock.

Softening Leather.

Neatsfoot oil will not soften leather under all circumstances, neither is castor oil any better. Oil is not necessary to the pliability of leather—the leather of the ox, goat, calf, and kid. It is necessary that the leather be kept moist; but oil need not be the moistening means. Yet in use oil is the most convenient means for keeping leather soft. It would be inconvenient to employ water to keep pliable the leather of our boots, because of its spreading the pores of the leather and admitting cold air; besides, unless always wet, leather becomes hard and rigid. Oil, on the contrary, keeps the leather in a proper state for its best usefulness, that of pliability. But in order that oil may soften the leather, its way should be prepared by a thorough wetting of the leather by water. Much less oil is required if the leather is well saturated with water. The philosophy is obvious; water is repellent to the oil, and prevents it from passing entirely through the leather, holding the oil in the substance of the leather. The use of water for softening belts in factories is not inconvenient, if advantage is taken of a holiday. At night the belts may be brushed clean and thoroughly wetted, then in the morning use the oil; a much smaller quantity is necessary to render the belt pliable than when no water is used.

MRS. LOUISA REED STOWELL has just been elected a member of the Royal Microscopical Society, of London, England. Mrs. Stowell is the third lady ever elected to this Fellowship. She is the only lady instructor in the University of Michigan, and is the author of several treatises on microscopical subjects.