EARLY HISTORY OF SAW-MILLS.

In early periods, the trunks of trees were split with wedges into as many and as thin pieces as possible, and if it was necessary to have them still thinner, they were hewn on both sides to the proper size. This simple and wasteful manner of making boards has still been continued in Russia to the present time. Peter the Great tried to put a stop to it by forbiding hewn boards to be transported on the river Neva. The saw, however, though so convenient and beneficial, has not been able entirely to banish entirely the practice of splitting timber used in roofing, or in making furniture and utensils; and, indeed, it must be allowed that this method is attended with peculiar advantages, which that of sawing never can possess. The wood-splitters perform their work more expeditiously than sawyers, and split timber is much stronger than that which has been sawn; for the fissure follows the grain of the wood, and leaves it whole; whereas, the saw proceeding in the line chalked out for it, divides the fibers, and by these means lessens its cohesion and solidity. Split timber, indeed, often turns out crooked and warped; but in many purposes to which it is applied, this is not prejudical, and such faults may sometimes be amended. As the fibers, however retain their natural strength and direction, thin boards particularly can be bent much better. This is a great advansage in making pipe-staves, or sieve-frames, which require still more art, and in forming various implements of the like kind.

Our common saw, which needs only to be guided by the hand of the workman, however simple it may be, was not know to the inhabitants of America when they were subdued by the Europeans.

The saws of the Grecian carpenters had the same form, and were made in the like ingenious manner as ours are at present. This is fully shown by a painting still preserved among the antiquities of Herculaneum. Two genii are represented at the end of a bench, which consists of a long table that rests upon two four-footed stools. The piece of wood which has to be sawn through is secured by cramps. The saw with which the genii are at work has a perfect resemblance to our frame saw. It consists of a square frame, having in the middle a blade, the teeth of which stand perpendicular to the plane of the frame. The piece of wood which is to be sawn extends beyond the end of the bench, and one of the workmen appears standing and the other sitting on the ground. The arms, in which the blade is fastened, have the same form as that given to them at present. In the bench are seen holes, in which the cramps that hold the timber are stuck. They are shaped like the figure 7, and the ends of them reach below the boards that form the top of it. The French call a cramp of this kind *un valet*.

The most beneficial and ingenious improvement of this instrument was, without doubt, the invention of saw-mills, which are driven either by water, wind, or by steam. Mills of the first kind were erected as early as the fourth century, in Germany on the small river Roer, or Ruer; for though Ausonius speaks properly of water-mills for cutting stone, and not timber, it cannot be doubted that these were invented later than mills for manufacturing boards, or that both kinds were erected at the same time. The art, however of cutting marble with a saw is very old. Pliny conjectures that it was invented in Caria; at least, he knew no building incrusted with marble of greater antiquity than the palace of King Mausolus, at Halicarnassus. This edifice is celebrated by Vitruvius for the beauty of its marble, and Pliny gives an account of the different kinds of sand used for cutting it; for it is the sand properly, says he, and not the saw, which produces this effect. The latter presses down the former, and rubs it against the marble, and the coarser the sand is, the longer will be the time required to polish the marble which has been cut by it. Stones of the soap-rock kind, which are indeed softer than marble, and which would require less force than wood, were sawn at that period; but it appears that the far harder glassy kinds of stone were sawn then also, for we are told of the discovery of a building which was encrusted with cut agate, cornelian, lapislazuli, and amethysts. There is, however, found no account in any of the Greek or Roman writers of a mill for sawing wood, and as the writers of modern times speak of saw-mills as new and uncommon, it would seem that the oldest construction of them has been forgotten, or that some improvement has made them appear entirely new.

When the Infant Henry sent settlers to the island of Madeira, which was discovered in 1420, and caused European fruits of every kind to be carried thither, he ordered saw-mills to be erected also, for the purpose of sawing into boards, the various species of excellent timber with which the island abounded, and which were afterwards transported to Portugal. About the year 1427 the city of Breslau had a saw-mill, which produced a yearly rent of three marks, and in 1490 the magistrates of Erfurt purchased a forest, in which they caused a saw-mill to be erected, and they rented another mill in the neighborhood besides. Norway, which is covered with forests, had the first saw-mill about the year 1530. This mood of manufacturing timber was called the new art; and because the exportation of boards was by these means increased, that circumstance gave occasion to the deal tythe, introduced by Christian III. in the year 1545. Soon after, the celebrated Henry Ranzau caused the first mill of this kind to be built in Holstein. In 1552 there was a saw-mill at Joachimsthal, which as we are told, belonged to Jacob Geusen, mathematician. In the year 1555 the Bishop of Ely, ambassador from Queen Mary of England to the court of Rome, having seen a saw-mill in the neighborhood of Lyons, the writer of his travels thought it worthy of a particular description. In the sixteenth century, however, there were mills with different saw-blades, by which a plank could be cut into several boards at the came time. Pighius saw one of these, in 1575, on the Danube, near Ratisbon, when he accompanied Charles, prince of Juliers and Cleves, on his travels. It may here be asked whether the Dutch had such mills first, as is commonly believed. The first saw-mill was erected in Holland at Saardam, in the year 1596, and the invention of it is ascribed to Cornelius Cornelissen, but he is as little the inventor as the mathematician of Joachimsthal. Perhaps he was the first person who built a saw-mill at that place, which is a village of great trade, and has still a great many saw-mills, though the number of them is becoming daily less, for within the last thirty years a hundred have been given up. The first mill of this kind in Sweden was erected in the year 1653.

In England saw-mills had at first the same fate that printing had in Turkey. When attempts were made to introduce them, they were violently opposed, because it was apprehended that the sawyers would be deprived by them of their means of getting a subsistence. For this reason it was found necessary to abandon a saw-mill erected by a Dutchman near London, in 1663; and in the year 1700, when one Houghton laid before the nation the advantages of such a mill, he expressed his apprehension that it might excite the rage of the populace. What he dreaded was actually the case in 1767 or 1768, when an opulent timber merchant, by the desire and approbation of the Society of Arts, caused a saw-mill, driven by the wind, to be erected at Limehouse, under the direction of James Stansfield, who had learned in Holland and Norway the art of constructing and managing machines of that kind. A mob assembled and pulled the mill to pieces, but the damage was made good by the nation, and some of the rioters were punished. A new mill was afterwards erected, which was suffered to work without molestation, and which gave occasion to the erection of others. It appears, however, that this was not the only mill of the kind then in Great Britain, for one driven also by wind had been built at Leith, in Scotland, some years before.

The application of the steam-engine has in modern times almost entirely displaced the use of either water or wind as the source of power in machinery, in England, as most of the saw-mills now in action, especially those on a large scale, are worked by steam.—*Beckmann's History.*

DYEING A PURPLE WITH MUREXID.

The objections which lately have been raised as to the instability of the murexid dye are said to be avoided by the process recently communicated by Mr. Wurtz, of Leipsic, to the *Deutsche Muster-Zeitung*. According to him, the pieces or woolen stuffs are very carefully cleaned in a strong soda-bath, and then in a soap-liquor. This complete cleansing is indispensable in order to obtain a fine hue. The soda solution should not, of course, be so strong as to effect the animal fiber; though both the soda and soap-liquor should be as concentrated as practicable. When the pieces have been thoroughly rinsed and and drained, they are placed in the following dye-bath:—To 12 lbs. of wool, add 350 lbs. of lukewarm water, (100° Fahr.) ¼ lb. murexid in powder, and 51 lbs. niter of lead. The murexid being mixed and dissolved in part of the water, the rest of this is added. Then the niter of lead previously dissolved in 30 to 35 lbs. of boiling water is poured in, and lastly the wool added. The dye-bath, is allowed to cool, the wool remaining in it for about 20 hours, after which it is taken out, slightly washed, and placed into the following fixing and reviving bath: 400 lbs. of cold water, 1 lb. of corrosive sublimate, and 3 lbs. of acetate of soda. Here it remains from five to seven hours, according as a more or less blue tinge is desired. After one dyeing a new operation may be commenced with the same liquors by adding ¾ of the same quantum of dyestuffs. The color thus obtained is stated to be far superior to that with cochineal. The quality and purity of the murexid is of great importance in this process, but the method, according to the opinion of practical men, is the best in use.

We have in former volumes given some practical information on murexid colors, part of which was obtained from German dyers in this city, and part was translated from German publications. Thus far, murexid colors have not superseded those obtained from cochi eal, and we think they never will, unless some substitute is discovered for the use of corrosive sublimate, which seems to be required for "raising the bloom," because colors so produced are liable to fade rapidly when exposed to the rays of the sun. We present the above in order to afford a subject for further experiment in practical chemistry.

A REMARKABLE SOLVENT.

It is now discovered, it appears, that if a piece of copper be dissolved in ammonia a solvent will be obtained, not only for lignine, the most important principle of all woody fiber, such as cotton, flax, paper, &c., but also for substances derived from the animal kingdom, such as wool and silk. By the solution of any one of these, an excellent cement and water-proofer is said to be formed; and, what is equally important, if cotton fabrics be saturated with the solution of wool, they will be enabled to to take dyes, such as the lac dye and cochineal, hitherto suited to woolen goods only. Hydriodide of ammonia, we may also observe, was not long since discovered to be an equally remarkable solvent, or, at least, insoluble, mineral substances. Now, it is an interesting circumstance that ammonia, according to Von Helmont and other old chemists and alchemists, was one of the requisite materials in the formation of the "alkahest," or "universal solvent," of the ancient sages! In the cupride of ammonium (if we may so call the solvent here first spoken of) we seem to have the solvent of silk which we have lately desiderated in our remarks on the insulation of submarine telegraph wires. — *London Builder.*

SPIRAL DRIVING NAILS AND BOLTS.—A patent has been got up by Mr. Montague Wigzel, of Exeter, for an invention, which he calls the "patent improved twisted or spiral fluted driving articles." Nails made on this principle prevent starting, and are said to be readily driven or twisted out, and they require no hole to be previously made. The idea seems to be a decidedly good one. The driving of such fluted nails and bolts into wood reminds one of the way in which the Armstrong bolts are driven through the rifled interior of the cannon, only in this case the rotation of the bolt is effected by the fluting of the bolt itself, and not by any rifling of holes in the wood.

[The above has been copied into several of our cotemporaries from foreign journals, and we must say that if there is any merit in the invention of this self-driving spiral bolt, we claim it for an American inventor, a native of Boston, whose name we forget, but who sent such a bolt to us at least ten or eleven years ago, and it was in our possession for three or four months before we returned it.—EDS.

FIRE-PROOF CLOTHING.—A writer in the *Polytechnic Notizblatt* proposes phosphate of ammonia as a most excellent substance for rendering garments as nearly fireproof as can be desired, and much superior even to liquid glass. A mixture of phosphate of ammonia and sal ammoniac has long been in use, under the name of "Gay Lussac's Preventive."