

Scientific Museum.

For the Scientific American.

On Tanning Leather.—Preparation of Hides.

(Continued from page 160.)

TAWING, CURRYING, AND LEATHER DRESSING.

CURRYING LEATHER.—The common mode of currying leather for shoes, boots, &c., consists in first softening the hides, as they come from the tan-pit, by soaking them thoroughly in water; they are then placed on a polished beam with the flesh side outwards, and pared with a broad sharp knife, till all the inequalities are removed and it is reduced to the required thinness. They are then again rubbed and washed with a polished stone and, while still wet, are besmeared with currier's oil, generally fish oil, or a mixture of this with tallow, which renders them much more impervious to moisture, and proper to protect the feet against the inclemency of the weather.—They are afterwards hung up to dry, by which the moisture is evaporated, but the oil, which cannot be dissipated by mere exposure, gradually takes the place of the moisture, and penetrates deeply into the pores of the leather. It is then dried either in the sun or in a stoved room.

Blackening the leather is also a part of the currier's business, which is done on the grain side simply by rubbing it with an iron liquor, but on the flesh side with a mixture of lamp-black and oil.

Common boot leather, as usually prepared, is, however, still, in some degree, pervious to water, by long exposure to wet, and for this reason fishermen, wild-fowl shooters, and those whose employment or amusement leads them to be long on wet ground, usually prepare their boots with an additional dressing of some oily or viscous matter.

SHADMOYED LEATHER.—This is generally prepared from sheep or does' skin prepared in the way already mentioned, by dressing, liming, &c., and dyed if necessary, and then finished with oil. This forms the common wash leather, breeches leather, &c., and is the only kind which, when dyed, will bear washing without the coloring being materially injured.

We add the following particulars relative to the manufacture of some of the most remarkable kinds of leather prepared in foreign countries, which although in most respects closely resembling ours, have distinct points of difference.

REAL MOROCCO LEATHER.—The process for the preparation of this leather from the goat-skins at Fez and Tetuan, is thus described by M. Broussonet:—The skins are first cleansed, the hair is taken off, limed, and reduced with bran, nearly in the way already described for the English Morocco leather.—After coming from the bran they are thrown into a second bath, made of white figs, mixed with water, which is thereby rendered fermentable, in which they remain four or five days, and they are then thoroughly salted with salgun (or rock-salt) alone, in lieu of the salt and alum; after which they are fit to receive the dye, which, for the red, is cochineal and alum, and for the yellow pomegranate-bark and alum; the skins are then tanned, supplied with a little oil, and dressed.

RUSSIA LEATHER.—Much excellent leather of every kind is prepared in different parts of the Russian Empire. The preparation of the fine Russian leather, so well known for its quality and for its peculiar smell, is described at large in Mr. Tooke's "View of the Russian Empire," to which we must refer the reader for the minutiae of the processes. The hides are first put into a weak alkaline ley to loosen the hair, and then scraped on a beam; then (if calves) are reduced by dog's dung and a sour oatmeal drench, and tanned with great care and frequent handling; the bark used here is seldom oak, that of the black willow being preferred; but if this cannot be obtained they use the birch bark. They are then either dyed red or black, these being the two colors most esteemed. For the red the hide is first soaked in alum, and then dyed with Brazil wood, and the black is given as usual with an

iron liquor. The leather is then smeared with birch bark, which gives the peculiar smell so much prized, and which, when used for book-binding, has the valuable property of protecting the book from worms. The streaked or barred surface is given to the leather by a very heavy steel cylinder wound round with wires.

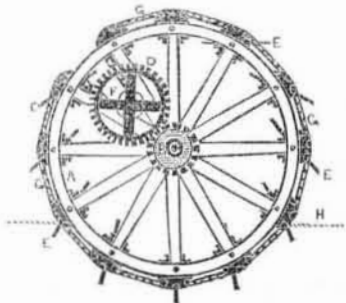
History of Propellers and Steam Navigation.

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PAUL STEENSTRUP'S PADDLE-WHEELS.

The form and full size of the paddle-wheels are a parallelogram, 1 foot deep, by 2 feet wide, terminated by a semicircle of 1 foot radius. These paddles are not immovably fixed, but turn on axes passing through the two opposite annular plates that form the periphery of the wheel, in order to allow of their dipping into the water edgewise, and thereby reduce the resistance of the water to the revolution of the wheel.

Fig. 21.



This Figure represents a side elevation of the wheel, with the paddles viewed edgewise.

A represents the paddle-wheel, B a cog-wheel bolted to the vessel's side, concentric with A and allowing the shaft C of the paddle-wheel to revolve in its centre; D a cog-wheel, double the diameter of B, revolving upon an axis supported by the arms of the paddle-wheel, and gearing into B; E the paddle, suspended by axles turning in the rim of the wheel; on each of these axles is fixed a chain wheel F, and a similar wheel is fixed on the axis of the cog-wheel D; G is an endless chain, passing over the wheels F, on the periphery of the paddle-wheel, and under the wheel F, on the axis of D; H represents a water line.

It will now be perceived that when the paddle-wheel is set in motion, the toothed wheel B being fixed, causes the large-toothed wheel D, to revolve upon its own centre, at the same time that it is carried round by the paddle-wheel, in a manner similar to the sun and planet wheel, in Watt's steam engine. The wheel D, being double the diameter of B, will perform one revolution upon its own axis, in the same time that it is carried round once by the paddle-wheel; and by means of the endless chain, passing under the small wheel F, on its axis, will cause each paddle to revolve once in its axis in the same time; and each paddle is constantly directed to the highest point in the rim of the wheel.

This wheel was patented as far back as 1828, and its very complexity is enough to condemn it at a glance. It is a most astonishing thing, how some people to remedy an evil, adopt another of far greater magnitude. A wheel of this description was exhibited in 1848, and 1849, at the Fair of the American Institute. It surely was not chosen as a subject of exhibition because of its utility. For complexity and utter impracticability, it was an ingenious invention; and, if these are qualities to recommend any thing, it surely deserves the highest eulogiums.

Wooden Books.

Mr. Vattemareproposes specimens of our forest trees in the form of books. In a collection of the kind at Warsenstem, near Cassel, the back of each volume, is formed of the tree, the sides are constructed of polished pieces of the same stock, and when put together a box is formed, inside of which is stored the fruit, the seed and leaves, with the mass which grows upon the trunk, and the insects which feed upon the tree. Every volume corresponds in size, and the collection together, as may well be imagined, has an excellent effect.

The bullion in the Bank of England now amounts to upwards of seventeen millions, the largest amount held by the Bank since 1844.

Hail.

This article, with a few alterations, we extract from that excellent work, the "Iconographic Encyclopedia," a notice of which we have given.

HAIL, one of the most peculiar phenomena in meteorology, is divisible into two principle classes: 1st. *Sleet*, composed of round granules, generally not more than two and a half lines in thickness, always opaque, and of snow white color, occurring in wintry weather. 2d. *Hail*, properly so called, consisting of granules of spherical, parabolical, or pyriform shape, varying in size from a cherry stone to a walnut. These have generally a point, opposite to which is a hemispherical segment, and in their centre is an opaque nucleus of one half to two lines in diameter. This species occurs generally in summer, in connexion with thunder and lightning. The two kinds however, according to Kaeintz, differ only in size. As a third and rare species, Arago considers that kind which are transparent, which are unquestionably produced by the freezing of drops of rain falling through a strata of colder air.—The form of *hail stones* is very various. The diameter of simple hail stones, at a mean latitude, according to Muncke, is not over one and a half inches, larger masses appearing to be produced by the aggregation of several. There are instances of hail stones being as large as hens' eggs. [We have seen them.] There are cases on record of vastly larger ones, but most of these are fabulous. According to Wallace, pieces of ice a foot thick fell in the Orkneys in 1780. In 1802 a piece of ice fell in Hungary, which was nearly a cube of three feet. In all these cases, the mass of ice must have been an aggregation of small lumps frozen together. In 1755 the hail fell in Iceland mixed with volcanic ashes, and in 1821 in Ireland, mixed with the sulphuret of iron. Hail generally falls through the day, but sometimes at night also. Smaller hail stones generally fall in spring: short showers of rain then alternate with sunshine. Fine granular hail frequently occurs on high mountains; on the higher Alps there are generally twelve falls of the fine for one of regular hail stones.

The real hail stones belong to the summer season, and are accompanied by severe thunder and lightning. Storms of this kind generally arise after clear calm weather, accompanied by long oppressive sultriness. The hail clouds appear to sweep low, with their edges jagged and their lower faces presenting irregular projections, the parts yielding hail generally forming very white streaks, the rest of the cloud being very dark. The barometer and thermometer sink rapidly, and a peculiar rustling in the air announces the hail cloud, and afterwards a darkness like an eclipse takes place. The hail lasts but a short time, rarely over 15 minutes, but which in that short time sometimes produces terrible effects. Hail storms move with great velocity, sometimes at the rate of 40 miles per hour. Men have been killed by them, and not unfrequently smaller animals. A hail storm occurred in France, in 1788, which devastated 1039 parishes, and caused the loss of more than 25,000,000 of francs. The area travelled by hail, is generally narrow, rarely over a mile, but its length is sometimes very great. In the tropics hail seldom occurs except on the mountains, and at the far north, large hail is seldom seen. The hail tract is generally confined to the region between 30° and 60° latitude, and to elevations under 6000 feet. Even within these limits there are countries where there is but little hail—such as in some of the valleys of Switzerland. In the low lands at the foot of high mountains, hail is more abundant at a certain distance from the mountains. There appears to be no regularity in hail storms.—Many plans have been tried to prevent hail storms, but none have been successful. Electric conducting rods were tried in 1776, by Guenaul de Mountbeillard, and in 1820 Thollard recommended hail conductors made of straw ropes attached to pointed rods, or of straw ropes with a metal wire interwoven. These methods were much followed without the least benefit flowing from them, and at the present day most meteorologists agree that there is no certain or practical method of preventing hail storms.

LITERARY NOTICES.

We have upon our table Nos. 1 and 2 of the AMERICAN HISTORICAL MAGAZINE, published monthly by L. Labree, 83 Nassau St., at \$2.00 per annum. We observe by reference to the prospectus of this work, that its design is very extensive and useful. It is devoted to the annals of the different States of the Confederacy—the statistics and romance of American history—contemporary facts worthy of preservation—reports of Historical Societies, &c. We have carefully examined the two numbers that have been issued and have no hesitation in giving it our unqualified commendation. And we hope (as we doubt not it will) that a generous encouragement will be extended to the publisher in his efforts to serve the public with a valuable work.

SARTAIN'S UNION MAGAZINE for February, Dewitt and Davenport, N. Y. Contains a beautiful mezzotint engraving of Benjamin West's first effort in art. The subject is well selected. Beside this it has a portrait of Mrs. Polk, wife of the late Ex-President, and a long line of interesting illustrations and sterling matter, which cannot fail of pleasing every lady of good taste. This number fully maintains the high standard of the Magazine.

PETERSON'S LADIES' NATIONAL, for February, as might be expected, maintains its high character for originality and readability. "The Truant" is a pretty picture, by Gimber. This number contains seven full page embellishments, and an excellent table of contents, from popular authors. Our readers will bear in mind that this Magazine is published for \$2.00 per annum.

HOLDEN'S DOLLAR MAGAZINE, February No.: W. H. Deitz, Publisher, N. Y. The number before us contains an excellent engraving of "Starrucca Viaduct." The portrait and biographical sketch of Thos. Convin, of Ohio, together with a likeness of the poet Wordsworth, the truthfulness of which we cannot vouch for. This magazine is conducted with much spirit and energy, and the small price for which it is furnished, brings it within the reach of every family.

GRAHAM'S MAGAZINE for February, appears upon our table, through the politeness of our friend Wm. H. Graham, Brick Church buildings N. Y. The engravings are rich and numerous, and the matter as usual entirely original, fascinating, and well arranged. This magazine enjoys a large share of public favor, and has attained it by no servility or ungenerous attempts to ride down contemporaries. Bear away Graham your path is full of flowers.

SPECIMENS OF THE STONE, IRON AND WOOD BRIDGES OF THE U. S. RAILROADS. Illustrated by plans, sections and details, from actual measurement of the work, with the bills of timber, iron, &c., showing the cost of each structure. By George Duggan, Arch't. and C. E. Published monthly and to be completed in 12 parts, at 75 cents each.—As this work is supplied to subscribers only, those wishing to possess it should forward \$5 to Munn & Co.,—the remainder, \$4, to be paid in 6 months.

GODEY'S LADY'S BOOK, for February, H. Long and Bro., New York. This number is an excellent one richly embellished, and filled with choice matter, as usual. Godey appears at full length in this number, and is really a "dapper" looking fellow.



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