

## Scientific Museum.

For the Scientific American.

### On Tanning Leather.—Preparation of Hides.

(Continued from page 122.)

TAWING, CURRYING, AND LEATHER DRESSING.

The skin of lambs, (as noticed last week), is then again softened by being thrown into a vat of bran and water, and kept there for some weeks in a state of gentle fermentation, being occasionally returned to the beam. All the thickening produced by the lime is thus removed, and the skin is now as highly purified as possible, and becomes a thin extensible white membrane, called in this state the pelt, and is now fit for any subsequent operation of tawing, dyeing, oil-dressing, or shammying.

**KID AND GOAT SKINS.**—The method of bringing kid and goat skins in the state of pelt is nearly the same as for lambs, except that the liming is used before the hair is taken off, the hair being of no great importance, and sold only to plasterers, but the lamb's wool, which is more valuable, would be injured by the lime.

If the pelts are to be tawed, they are then put into a solution of alum and salt in warm water, in the proportion of about 3 pounds of alum and 4 pounds of salt to every 120 middle-sized skins, and worked about in it till they have absorbed a sufficient quantity. This again gives the skin a remarkable degree of thickness and toughness. The skins are then taken out and washed in water, and then again put into a vat of bran and water, and allowed to ferment for a time, till much of the alum and salt is got out, and the unusual thickness produced by it is for the most part reduced. They are then taken to a lofty room, with a stove in the middle, and stretched on hooks, and kept there till fully dry, when they become tough and flexible, and quite white leather; but to give them a glossy finish, and to take off the harshness of feel still remaining, they are again soaked in water to extract more of the salt, and put into a large pail containing the yolks of eggs beat up with water. Here the skins are sodden for a long time, by which they so completely imbibe the substance of the egg that the liquor above them is rendered almost limpid; after which they are hung up in a loft to dry, and finished by glossing with a warm iron, which completes the operation.

The essential difference, therefore, between tanning and tawing is, that in the former case the pelt is combined with tan and other vegetable matter, and in the latter with something that it imbibes from the alum and salt, (probably alumine,) and which certainly is never again extracted by the subsequent washing and branning.

**ENGLISH MOROCCO LEATHER.**—The leather called morocco leather, which is chiefly prepared from sheep-skins, and used so largely for coach-lining, pocket-books, and the best kind of book-binding, is thus made:—The skin, cleansed and worked in the way already described, is taken from the lime-water, and the thickening thereby occasioned is brought down, not by bran liquor, as in tawing, but by a bath of dog's or pigeon's dung, diffused in water, where it remains till sufficiently supplied, and till the lime is quite got out, and it becomes a perfectly clean white pelt. If intended to be dyed red, it is sewed up very tight in the form of a sack with the grain side outwards, (the dye being required only on this side,) and is immersed in a cochineal bath of a warmth just equal to that which the hand will bear, and is worked about until it is uniformly dyed, a process that demands much skill and experience. The sack is then put into a large vat, containing sumac infused in warm water, and kept for some hours until sufficiently tanned. The skins intended to be blacked are merely sumaced, without any previous dyeing.

After some further preparation, the color of the fine red skins being finished with a weak bath of saffron, the skins, when dried, are grained and polished in the following manner:—They are stretched very tight upon a smooth inclined board, and rubbed over with a little oil to render them supple. Those intended for black leather are previously rubbed over with

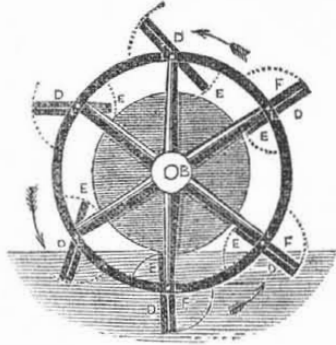
an iron liquor, by means of a stiff brush, which, uniting with the gallic acid of the sumac, instantly strikes a deep and uniform black.

They are then rubbed by hand with a ball of glass cut into a polygonal figure, which polishes them, and makes them very firm and compact. Lastly, the graining or ribbed surface, by which this kind of leather is distinguished, is given by rubbing the leather very strongly with a ball of box-wood, round the centre of which a number of small equidistant parallel grooves are cut, forming an equal number of narrow ridges, the friction of which gives the leather the desired inequality of surface.

### History of Propellers and Steam Navigation.

(Continued from page 155.)

FIG. 19.



This invention is that of Lieut. Skene, R. N., invented in 1828. The form and full size of the paddles 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 vibrate 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 reducing the resistance of the water to the revolution of the wheel. For this purpose, the lower or semi-circular portion of each paddle is loaded with metal, the superior gravity of which, to that of the upper portion, causes each paddle successively, as it enters the water, to assume the vertical position; and to prevent their turning over, a simple stop is provided (which will presently be explained) so that the full effect of the impelling power of the engine may be given to each paddle, at the proper time. To prevent the water from escaping sideways between the arms of the wheel a large disc or circular plate is fixed against the internal sides of the wheel, and of such diameter as not to come within the range of the paddles as they vibrate on their axes.

The number of paddles to each wheel is to be regulated by the diameter of the wheel; which is, for every foot in diameter, one paddle; therefore, for six-foot wheel there are to be six paddles. This figure represents a side elevation of the wheel, with the paddles, viewed edgewise. A A A are the arms of the wheel, revolving upon the shaft B. D D D are paddles, of which F F F are the loaded sides; L L are the axes of the paddles, the dotted arcs of circles, at the extremities of the paddles, shew the range of their motion, which is arrested by the stops, E, that consist merely of a prolongation of the upper sides of the paddles striking against the arms, or the inside of the rims of the wheel.

Experiments were made with this paddle wheel, the paddles measuring 16 by 16 inches, and their extremities, describing a circle of nine feet nine inches in diameter. The boat run on the River Thames, the engine making 45 strokes per minute. It was an entire failure, for it went much slower when the paddles operated as designed, than by an experiment of lashing them to make them immovable. The back water was excessive, thrown right astern. In turning, the paddles seemed to strike the arms and the rim of the wheel with great violence, causing a great noise. The vibration of the vessel was very great, and the paddle box shook with great violence. In revolving rapidly, it is very evident that the centrifugal force, has a tendency to throw the paddles outward to prevent them from entering the water in a vertical position, consequently no advantage, but a disadvantage

would be the result. It is a great evil also to have the lower part of the paddles heavier than the upper, if turning, as these paddles do, on an axis. The reason of this is obvious, not in entering, but in rising out of the water, causing an unequal wear on the axis, thereby creating a great deal of friction. The thicker the blades of the paddles are so, much of their useful effect must be subtracted from the circumference of the wheel, when we measure the distance the vessel travels, by the number of revolutions of the wheel.

### Hunting Rats for Gloves.

In Paris the public sewers are huge subterranean passages, about 150 leagues in extent. A plan has been got up to destroy the rats that infest them by hunting them into *battues* (driving them into corners.) By the last accounts 250,000, have been slain, and it is supposed that 600,000 will be destroyed by the end of this month.

Several plans of destruction were made use of by the different brigades of sewer-men, but that which was found to be most successful was the placing a large leather sack in which a large piece of mutton tallow was placed—at the corner of each sewer, and toward which the animals were driven. The Union, in giving an account of the affair says: "The 250,000 rats were all of the grey Norwegian breed, except from 500 to 600 black or English rats. Two of these animals were put aside by the men as a curiosity, to be presented to the collection of animals at the Jardin des Plantes. From the extremity of the tail to the tip of the nose these two rats measured 51 centimetres (nearly 20 inches English.) Their eyes are red like those of white mice, and their coats are as black and glossy as the silk on a hat. The ferocity of these animals is such that one of the Norwegian rats was literally devoured in ten minutes by the two English rats.

Mr. John Warton, a rich leather dresser in London, will buy the whole lot of them, even if they number 1,000,000.

### Origin of Literary Degrees.

The practice of conferring honors of literary institutions on individuals of distinguished erudition, commenced in the twelfth century, when the Emperor Lothaire, having found in Italy a copy of the Roman law, ordained that it should be publicly expounded in the school; and that he might give encouragement to the study, he farther ordered that the public professors of this law should be dignified by the title of doctors. The first person created a doctor after this ordinance of the Emperor, was Bulgarius Hugolinus, who was greatly distinguished for his learning and literary labors. Not long afterwards the practice of creating doctors was borrowed from the lawyers by divines also, whom, in their schools, publicly taught divinity, and conferred degrees on those who had made great proficiency in that science. The plan of conferring degrees in divinity was first adopted in the Universities of Bologna, Oxford and Paris. (See Mather's *Magnalia Christi Americana*, B. IV. p. 134.) It is remarkable that the celebrated Dr. Samuel Johnson, when he had become eminent in literature, could not obtain the degree of Master of Arts, from Trinity College, Dublin, though powerful interest in his behalf for this purpose by Mr. Pope, Lord Gower, and others. Instances of the failure of similar applications, made in favor of characters still more distinguished than Johnson then was, are also on record.

### Remarkable Escape.

Mr. Hathaway, while at work lately at the Nail Factory, on Deer Creek, near Cincinnati, Ohio, was caught by a nail machine, and all his clothes literally torn off his body, and yet, strange to say, he received no personal injury but suffered some inconvenience and delay in getting dressed again.

### Steamboat Disasters during 1849.

The St. Louis papers publish lists of steamers blown up, sunk or otherwise destroyed in the west during the past year. The total number is 112, of which 83 were totally lost. The estimated pecuniary loss is set down at \$2,000,000, and the loss of life upwards of 200 persons, and perhaps as many were wounded and

maimed. This is a formidable list truly, and should arouse the attention of Congress to the improvement of western navigation.

### LITERARY NOTICES.

**THE SCALPEL.**—No. 6 of this sterling journal has made its appearance. It contains a searching inquiry into the causes of early decay in American Women. Sketches of New York Physicians, Causes, Anatomy and Cure of falling of the womb, Introduction to the Gout, Tartar Emetic, by a medical heretic—Satrial, &c. This journal is edited by Dr. Dixon, one of the most accomplished and original physicians in this country, who has the nerve to battle the abuses which have crept into the profession of which he is a "burning light," success to his efforts. We would say to such of our friends as may wish the numbers of this work, that we have made arrangements with the Dr. to supply them. It is published quarterly at \$1 per annum, single copies 25 cents.

**THE LITERARY WORKS.**—Of the late Edgar A. Poe, with notices of his life and genius, by N. P. Willis, J. R. Lowell, and R. W. Griswold. Published by J. S. Redfield, in two Vols. These volumes contain nearly 1000 pages of clearly printed matter, characteristic of the prolific genius of the author, but they lack a good biography of his erratic life, which ought to have been given by his friends whose names appear in the work; he was a highly finished writer, powerful in his imagination, and his writings are characterized by a peculiar charm which render them a pleasant companion. Mr. Redfield has performed his part of the work in a creditable manner, and we commend them to the consideration of the public. Mrs. Clemm, the mother of Mrs. Poe, (for whose benefit they are published) prefaces the work with some kind remarks to the reader.

**THE PHYSIOLOGY OF DIGESTION.**—Considered with relation to the principles of Dietetics, by Dr. Combe, Fowlers and Wells, publishers. This volume of 300 pages contains "home truths for home consumption," and should be carefully read by all who desire plain, common sense reasoning. Our people are sadly in want of the whip and spur upon this subject, and although we are not bound down to a very strict order in diet, yet it is the part of reason to accommodate ourselves to the varying circumstances of climate &c., and observe such rules as are conducive to health and longevity. This work is sold for the trifling sum of 25 cents, and should meet with a large demand.

**GRAMMAR OF ARITHMETIC.**—This is a small volume by Prof. Davies, L. L. D., the most eminent Mathematical author in the United States. It presents the subject of Arithmetic in a new light, making it the language of figures, and we can positively say, that it is eminently adapted to impress the first principles clearly upon the minds of the pupils. It is published by A. S. Barnes & Co., No. 51 John Street, New York.

**NEW YORK BY GAS LIGHT.**—By C. C. Foster, author of "New York in Slices." Published by Dewitt and Davenport, Tribune Buildings. This is a work of deep interest to all who desire a peek into Gotham. Price 25 cents.



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