

## Scientific Museum.

For the Scientific American.

### Tanning--Practical Remarks.

(Continued from page 216.)

It may be well, in this place, to remark that the process we are describing in this series of papers, is for HEMLOCK SOLE LEATHER, the great article of the trade, at the present time, in the United States. Upper leather and oak leather generally require different treatment in the early stages. The last run of the leeches is first used upon the leather, a certain number of vats are constructed for handlers. They are 5 feet wide  $5\frac{1}{2}$  deep and 8 feet long usually, with lines of logs, laid underneath to run off the exhausted liquor into the tail race. They should never lead into the junk, or through the junk, to prevent the possibility of the spent liquor being pumped on to the leeches; lest it should contain some of the jelly of the hide, as intimated in our last number. A three inch tube carefully fitted connects the vat and the log; a long plug, protected by an eye broad all in one corner of the vat, closes the tube. The seams in all the vats and leeches are thoroughly caulked with oakum, so as to be water tight. The handler vats are arranged in sections of 8 to 10 always leaving one not filled with sides. This vat should be run up two-thirds full of the last run before alluded to, by the night watch, to be ready for the morning business. The oldest pack in the section is called the head pack—these are raised by a yard hook, and spread into the new liquor of the vat along side, or when the handlers are full, are doubled and thrown up in a square pile, to drain until they are removed to the yard. The next pack in order is raised in the same manner, and by a double shift is spread into the new liquor. Each succeeding pack in the section is served in the same way, until the whole are brought forward, leaving two vats of the section without sides. Into the first of these, a pack of green stock from the beam house, is spread (70 to 90 in number), care being taken that each side sinks before another is cast in, (as should be done with every pack), while the other is run off through the logs into the stream. It is well, if there is spare time, to stir this green pack, by lifting them with a pry at each corner alternately for an hour or two, but it is not indispensable.

The tan of the liquor is rapidly exhausted, and the residuum becomes slightly acid in the last 3 or 4 vats of the section, so as to plump the sides to their natural state. The grain of the leather is raised smooth and fair, which is of great importance in finishing. The old method of handlers which is still practised by many tanners, is to color their green packs in new liquor for one day, raising them two or three times, and keeping them in sweet and stronger liquor through a section of four or six; but the grain is apt to be drawn, and the complexion some shades darker—the whole not so plump as by the new system.

The character of the leather under the old method often depends upon the first day's management in the handlers, and no subsequent efforts can entirely remedy any neglect or carelessness here: it is not so liable under the new. The careful tanner will, however, strengthen up the handlers from the third to the seventh, during the warm months, if he works in at that time. Sweating is the first stage of putrefaction, and in a warm temperature rapid decay follows, unless the temperature is reduced. It must be arrested at the right moment, or the stock is damaged. Cold spring water, or an abundant supply of ice, should be at ready command for this purpose. This danger continues to the handlers: any heat in the liquor is very hazardous, in this stage: indeed, should never be allowed at any time when it is put upon the leather.

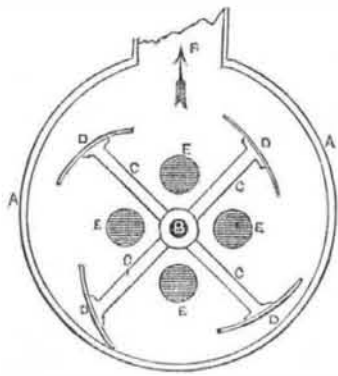
An ample supply of two inch plank, cut 8 inches longer than the width of the vat is always kept on hand, to make platforms on which to spread the packs, and temporary alleys over which to wheel them from the beam house to the handlers, and to the yard. The head packs are loaded upon wheelbarrows, by the yard hands, at any time their work will

permit, and are removed to a platform laid over the vat alongside of the one they are to occupy, and are spread out at full length, the backs all lying one way—to be laid away, which we shall describe in our next.

### History of Propellers and Steam Navigation.

(Continued from page 216.)

FIG. 30.



This is a mode of propelling invented in England, about 1829 or 1830, by a Mr. Hale. It was revived in 1847, by Simpson, and tried both on the Thames and the Clyde. An engraving of it appeared in the Illustrated London News in 1848, and although it was a little different from Mr. Hale's plan, the principle in no respect was changed—it was only a modification, (if it can be called that) of the blower substituted for the Paddle Wheel. It received high commendations, from some of the foreign periodicals, when employed by Simpson, and the boat to which it was applied with four feet paddle boxes, went at the rate of 11 miles per hour on the Thames. Its first performance seems to have been its last, for since that period, it has not, so far as we are informed, broken the waters of the classic "clutha," or muddy Thames.

Fig. 1, represents one modification of the apparatus, and consists of an air-tight circular casing A A, containing four arms C C C C, which revolve horizontally on a vertical axis B, placed eccentrically with respect to the casing; at the extremities of the arms are fixed 4 curved vanes or paddles D D D D, inclined in the manner represented in the drawing. The water enters the casing through the holes E E E E, and is expelled by the revolution of the paddles through the opening F, against the external water at the stern, which of course impels the vessel in a contrary direction.

FIG. 31.

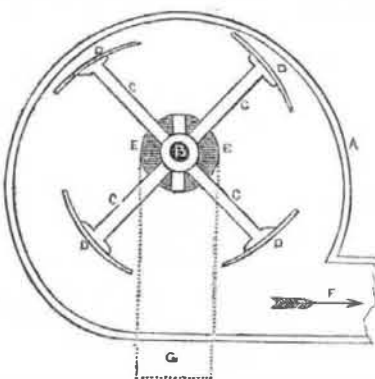


Fig. 2, is another modification of the apparatus. In this, similar letters of reference indicate similar parts, with only these differences in the arrangement, that the water is received at one large aperture in the centre of the vanes, the line of direction of the discharge being a tangent to the circle. The dotted lines at G denote a tube leading from the bottom of vessel through which the water ascends into the paddle-box; and it may be supposed, that similar tubes are employed in the first described plan, for conducting the water into the paddle-box.

The centrifugal force of the paddles acting on the water within the box, produces a pressure all round the interior of the box, which gives a tendency to move in a direction opposite to the side where the opening is made in the circumference; while the same causes accelerate the entrance of the water into the box, which is produced in the first instance by the paddle-box being placed within the vessel, and lower than the exterior water.

### Oat Meal.

Experience had long taught the Scotch that oats, such as they grow in their climate, are a most nutritious food; but the habits of the more influential English and the ridicule of a prejudiced lexicographer, were beginning to make them ashamed of their national diet.—Chemistry has here stepped in, and by her analysis of both, has proved not only that the oat is richer in muscle forming matter than the grain of wheat, but that oatmeal is in all respects a better form of nourishment than the finest wheaten flour. But what is more, chemistry has brought us acquainted with the value of parts of the grain formerly considered almost as waste. The husk or brain of wheat, for example, though given at times to pigs, to millers' horses, and other cattle, was usually thought to possess but little nutritive virtue in itself. Analysis, however, has shown it to be actually richer in muscular matter than the white interior of the grain. Thus the cause of its answering so well as food for cattle is explained; and it is shown that its use in bread (whole-meal bread) must be no less nutritive than economical. The true value of other kinds of food is also established by these inquiries. Cabbage is a crop which up to the present time, has not been a general favorite in this country, either in the stall or for the table, except during early spring and summer. In North Germany and Scandinavia, however, it appears to have been long esteemed, and various modes of storing it for winter use have been very generally practiced. But the cabbage is one of the plants which has been chemically examined, in consequence of the failure of the potato, with the view of introducing it into general use, and the result of the examination is both interesting and unexpected. When dried so as to bring it into a state in which it can be compared with other kinds of food (wheat, oats, beans, &c.) it is found to be richer in muscular matter than any other we grow. Wheat contains only about 12 per cent., and beans 25 per cent.; but dried cabbage contains from 30 to 40 per cent. of the so-called protein compounds. According to our present views, therefore, it is pre-eminently nourishing.—Hence, if it can but be made generally agreeable to the palate, and easy of digestion, it is likely to prove the best and easiest cultivated substitute for the potato; and no doubt the Irish kolecannon (cabbage and potatoes beat together) derives part of its reputation from the great muscle-sustaining power of the cabbage—a property in which the potato is most deficient. Further, it is of interest—of national importance, we may say—that an acre of ordinary land will, according to the above result, produce a greater weight of this special kind of nourishment in the form of cabbage than in the form of any other crop. Thus twenty tons of cabbage—and good land will produce, in good hands forty tons of drum-head cabbage on an imperial acre—contain fifteen hundred lbs. of muscular matter; while twenty-five bushels of beans contain only four hundred pounds; as many of wheat only two hundred, twelve tons of potatoes only five hundred and fifty, and even thirty tons of turnips only a thousand pounds. The preference which some farmers have long given to this crop, as food for their stock and their milk cows, is accounted for by these facts; while of course they powerfully recommended its more general cultivation as food for man.

### A Question for Naturalists.

The Charleston Mercury thinks every sea-serpent story for the last fifty years may find its solution in the explanation given of the Beaufort sea-serpent last week. A number of persons testified that they saw its head and mouth and the humps upon its back, but it turned out that the serpent was four whales following each other in "Indian file." The Mercury says it is worth while to inquire whether whales do not instinctively follow a leader in this manner, when they become perplexed by the obstacles of a coast and the dangers of shoal water.

Mr. Stanley in his great speech, said that "England punishes any man who induces an artisan to leave her shores." Surely the school-master is abroad in Congress.

### LITERARY NOTICES.

THE NEW YORK MERCANTILE UNION BUSINESS DIRECTORY.—Containing a map of New York city and State, and a business directory showing the name, location, and business of mercantile firms, manufacturing establishments, professional men, artists, corporations, moneyed and literary institutions, courts, public officers, and all the various miscellaneous departments which contribute to the business, wealth and prosperity of the state. So far as we are able to judge, we should think the enterprising publishers of this volume, had displayed much energy in collecting together so correctly, the great amount of matter here given. We find the work one of much value in our business, as it aids us in referring correspondents to the manufacturers of such articles as they often enquire for. This reminds us of calling upon our readers, to secure a copy of it without delay, as it will save them much trouble in ascertaining the residence of those with whom they may wish to deal. The work is particularly valuable to city merchants, as we suppose it frequently happens, that they wish to send on their business circulars,—for the small sum of two dollars they are possessed of every name, which might cost them otherwise to obtain ten times that amount. This work is published by S. French, and L. C. and H. L. Pratt, 293 Broadway, and is invaluable to every business man.

DRAMATIC WORKS OF SHAKESPEAR.—Boston illustrated edition, Phillips, Sampson & Co., publishers, Dewitt and Davenport, agents, N. Y. No. 12 contains the comedy of "All's Well that Ends Well," with a splendid steel engraving of "Helena." The letter press of this work is exceedingly well executed on the finest calendered paper. Two numbers are issued each month, and when complete, will contain about 40 fine steel engravings, forming the most elegant edition of Shakespear, ever issued from the American press.

SARTAIN'S MAGAZINE OF LITERATURE AND ART.—The April number of this popular monthly has made its appearance, and is one of the best numbers that has been issued. Sartain for April, contains 27 original articles from the pens of a like number of contributors, and 12 fine engravings, some of which are very beautiful. Dewitt and Davenport, Agents, Tribune Buildings.

We are also indebted to Messrs. Dewitt and Davenport, Tribune Building, for the April number of Peterson's Ladies National, which, as usual, is filled with rich embellishments and choice literary matter.

HOLDEN'S DOLLAR MAGAZINE, N. H. Deitz, publisher, N. Y. The April number of this Magazine is filled with choice original matter and several illustrations. The work continues to increase in interest, and the publisher seems determined not to be outdone.

THE PHRENOLOGICAL JOURNAL—Published by Fowler and Wells, New York, is an excellent work, full of sensible and well written articles.

TYPOGRAPHICAL MISCELLANY—No. 3, by Joel Munsell, Albany. This is a monthly periodical which every printer should subscribe for, both on account of its merits, as a useful work, and for many other considerations beside.

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