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On Tanning Leather.--Preparation of Hides. (Continued)

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## Scientific Museum.

For the Scientific American.

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

(Continued from page 128.)

Mr. J. Burbridge, of England, published in 1825, a work called the "Tanner's Key," wherein he states that he tanned crop hides of the very best quality in 101 days, during mild weather. He says "lime your hides about a week, then unhair them and let them soak in a running stream of water 12 hours; then flesh them, and afterwards run them through the running brook again—all the lime should be completely washed away. When the hides are thus prepared, they should be immersed in tannin liquor at the strength of five degrees of the hydrometer, and in this liquor they should be handled frequently for three days, then shift them into liquor of seven degrees strength, and continue this shifting, until the gluten in the skins is dead—which will take about two months, during which time they should be well handled, and as often as possible, and sometimes a little bark added to keep up the strength of the liquor, which should never be allowed to be weaker than the tan vat in which the skins have once been in, or the skins will be injured. The strength of the liquors must be gradually increased from 5 degrees up to 15, and sometimes 20, and if after they have remained in this strong liquor three days, and the said liquor not weakened any, it is a good sign they are quite tanned."

There is not a single tanner but should use an instrument to test the strength of his liquors. Without it he may be said to have a system, but employs no sure sentinel to stand guard over it. And if he desires to try experiments, he is not sure of accuracy unless he uses the hydrometer. Some bark, pound for pound, is inferior in strength to others—what then is to guide the tanner without his glass? Nothing but guess work.

It sometimes happens that after tanning for some months, the centre of the hide is not quite like the outside, it is then necessary to give the last liquor pretty strong and somewhat warm. In England some recommend *valonia* (an acorn brought from the Levant) which being ground, is sealed at the rate of 200 pounds to 200 gallons of water, and added to the strong bark liquor vat. This is said to be a good plan and makes beautiful leather. As such a plan is not suited to America, some other substance should be used, and there can be no doubt but that if our tanners, who use hemlock bark exclusively, would give the last liquor to their skins of oak bark, they would find a great improvement made in their leather—and one that would pay. Those who use oak bark should give a change, too, in finishing it, such as using (willow, if it were possible) the bark of the yellow oak, or good sumac.

The tan vats are strong rectangular wood boxes, or holes made in the earth, and cemented up inside with a facing of brick, and they are made of such size as are necessary for the work required—the batch of hides to be immersed at one time. It is common to hang up the hides, suspending them in the tan pits, but this should not be done until the hides are half tanned. The liquor in the pits are tapped, so that the exhausted liquor is pumped out, and the liquor from the next strongest pumped in, and so on, the last getting the additional strong liquor. It would be a good plan, if all the bark chips were boiled and the liquor only used. If bark is boiled to extract its strength and then the bark and liquor thrown into a vessel, and left to stand for some days, it will be found that the strength of the liquor is afterwards absorbed by the bark.

Many patents have been taken out, both in America and Britain, for improvements in Tanning. One process was no other than to tan the hides in air-tight vats, extracting all the air by an air-pump. One was granted to Mr. Brown, of New York, for a curious and good manner of working the leeches, and working or handling the hides by reels—a good plan. Another plan was proposed to prick the

hides with fine perforations, to let in the tannin to the centre of the hide—not a very commendable plan, we think. Another plan was to evaporate, by artificial heat, the ooze from the one side of the skin, while the tan liquor was applied to it cold on the other. This plan was patented in England about 18 years ago, and although it was stated to tan the skins well in about ten days, yet it was so evidently troublesome and expensive that it made no advancement in public favor. A great number of patents might be enumerated. Such as one for revolving hides on the periphery of a wheel—a number being used, and another to agitate the hides in the pit, simply by a paddle wheel revolving in it, to move the hides, which are not to be crowded in the pit—a very good plan indeed.

The whole secret of tanning lies in great carefulness, plenty of labor and patience.—Let the hides be well cleaned of their lime, &c., before they are immersed in the tan liquor, and let them be well handled and changed every four days, or oftener, and pay attention to the strength and heat of the liquors, and there is no danger.

Hemlock, oak bark, and sumac, are the most common tannin ingredients used in America. Sumac is coming more into use lately, great quantities of it are now employed for all kinds of the finer hides, but hemlock is generally used for sole leather. The liquor in the vats should not be more than milk warm.

### History of Propellers and Steam Navigation.

(Continued from page 128.)

FIRST SEA VOYAGE—ARGYLE AND THE SAVANNAH.

By the latest news from Europe, we learn that Sir Isambert Brunel, the great Civil Engineer, who completed the celebrated Thames Tunnel, has finished his course and departed. But Sir I. Brunel did not project the Thames Tunnel. The man who first designed that great work was the person who performed the first sea voyage in a steamboat. That man was George Dodd, whose life was full of eventful actions—whose death was within the walls of a prison.

After Henry Bell had established steamboat navigation in Europe, it was still a question whether or not steamboats could be employed for open sea navigation—nautical men entertained the opinion, that they were unfitted to brave it. George Dodd, a London Engineer, a young man of great resolution, was sent down to Scotland and purchased the Argyle, a steamboat which used to ply between Glasgow and Greenock, (20 miles.) She was 70 tons, 79 feet keel, 16 feet beam, had an engine of 14 horse power, and paddle wheels of nine feet in diameter. She was purchased to run on the Thames: John Wood was the builder. She had her engine in the middle, the boiler on the starboard side, and a fly-wheel on her larboard side. Her funnel (smoke pipe) did the duty of a mast and carried a square sail. Mr. Dodd's crew consisted of a mate, four seamen, an engineer, stoker and a cabin boy. He left Glasgow, not without great misgivings on the part of many people in that city, but he had full confidence in his boat and crew, and boldly put to sea. (We would like to give the whole of this remarkable voyage of 758 miles, on a dangerous sea, and amid tremendous storms.) He established the feasibility of sea steamboat navigation. His vessel must have been a good one, and her engines of excellent construction, for he used only one ton of coals for 100 miles: better than that is not done now. When it is considered that this vessel was only 14 horse power, it required no ordinary courage to embark on such a dangerous voyage; and when it is remembered how successfully this voyage was completed, we must give credit to the old Argyle, as the first worthy sea steamboat, and the unfortunate George Dodd, the first sea steam navigator. Although steamboats had been running in Scotland for five years before, when the Argyle entered the Thames and came to London, she was regarded with the most intense wonder.

The first steam ship that crossed the Atlantic was the American steamship Savannah, built in New York, in 1818, which, under her

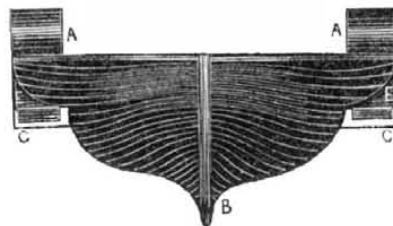
commander Moses Rogers, sailed from Savannah, Geo., on the 25th of May, 1819, direct for Liverpool, and made the passage in 22 days. She was 350 tons burden, had one engine of 80 horse power, and was a good sailer, making at the rate of 8 knots per hour in pleasant weather. When she approached the west coast of Ireland, the telegraph station at Cape Clear, reported her as a ship on fire, and one of the Navy Cutters was despatched to her relief—great was their surprise to find her a live American steamboat. Before this, however, on the east coast of Ireland, steamboats were well known, and a regular line between Glasgow and Belfast had been established by David Napier, for more than a year.

When the Savannah came to Liverpool she excited much surprise. On approaching the city, the shipping, piers and roof of houses were thronged with an excited populace, cheering the adventurous craft. During her stay at Liverpool, naval officers, and noblemen and merchants from London came down to visit her, and were singularly curious to ascertain her speed, destination, &c. As it will be remembered, this was soon after Jerome Bonaparte had offered a large reward to any one who would succeed in rescuing his brother Napoleon, then at St. Helena, this was the suspected design of the Savannah's visit. After a stay of 28 days in Liverpool, during which time the ship was visited by thousands of people of rank, and her officers the while treated with marked attention, she left for Copenhagen, Denmark.

To the Savannah belongs the credit of making the first steam voyage across the Atlantic, and to Capt. Rogers the credit of being her first commander. It is astonishing that after this we hear no more of the Savannah as a sea steamboat. Why was it that from 1819 to 1838 no other steamship navigated the Atlantic from America to England? We cannot answer.

In 1819 three very scientific gentlemen of Glasgow, Scotland, conceived the idea of propelling vessels by water in a very different way from Rumsey or Linaker. The scheme was to discharge water behind with great velocity, from pipes placed under the surface,—using the water underneath the surface, somewhat as a fulcrum. After an expensive experiment the propelling power was found to be totally inefficient to compete with paddle wheels, and it was therefore abandoned.

FIG. 12.



In 1822 a Mr. D. Gordon, of London, invented the casing for the paddles, allowing the water to enter at an aperture below the level of the water line, but allowing the water to leave freely at the back. This figure is a view towards the head of the vessel. A is the paddle wheel case; B the fore part of the keel, and C the place for the water to enter, below the water line, E. The aperture to admit the water, was furnished with a sluice to admit a greater or less quantity of water, according to the velocity of the vessel or the roughness of the water. This invention was tried—but to be laid aside.

### The Tea Plant in America.

Dr. J. Smith of Greenville, S. C., says that the tea plant, with ordinary care, will flourish upon Long Island. They ought not be housed, or put into hot-houses; that would weaken the vigor of the plant. In very severe weather, whilst young and delicate, they will require covering with clean straw,—not with the litter of a stable. In two or three winters they will stand the temperature as well as an oak. To show this fact, I have one green tea plant in my tea garden, planted out last December, fresh from the case in which it was imported, weakened by the voyage, and heat of the packing, which was never recovered or protected in any way, that stood the severe

cold of February last, with the thermometer at zero!—The leaves which remained after transportation, dropped off, but the branches and twigs, ten to fourteen inches in length, remained uninjured, and came out in April in fine leaf and in that condition now, as fine a plant as ever grew. There the plant stands, an incontrovertible fact.

### LITERARY NOTICES.

TREATISE ON MARINE AND NAVAL ARCHITECTURE, OR THEORY AND PRACTICE BLENDED IN SHIP BUILDING.—This is the title of a new work, by J. W. Griffiths, Esq., Marine and Naval Architect, N. Y., a gentleman of eminent scientific qualifications, and great practical experience. The subject of the author is one of great importance, especially to the United States. No European work of the kind is of much use, if we can believe no less authority than Admiral Sir Charles Napier, who, in a recent letter to the London Times, proves incontestably, that ship-building, as a science, is not understood by the best authorities of that Maritime Nation. New York has long been famous for ship-building, and as a matter simply of experience, the work of Mr. Griffiths would be a valuable acquisition to our store of knowledge on this subject, but he aims at a higher object. To use his own words, it is "designed to form the connecting link between science and practice, with a view to the elementary instruction of those who have not previously studied the principles of science in modelling and building ships." The first number of the work commences at the root of the matter, with the history of ship building, equilibrium of fluids, &c. The letter press is good, and the whole work is to be illustrated with 50 beautiful engravings, and 12 Nos., at 75 cts. each, is to complete the work—thus placing it within the reach of every man. From the first No. which is before us, we have no hesitation in stating, as our own opinion, "that it will be *The Book of Naval Architecture*."

YANKEE NATION.—We perceive by the last No. of this journal, that Mr. Trowbridge, its able Editor, has transferred the business management of it to Messrs. Hotchkiss & Co., the well known conductors of the most extensive Periodical Agency in New England. Under its new management, combined with the ability of Mr. Trowbridge, who still continues at the head of the editorial management, we feel assured it will rise to the first rank among the literary journals of the day. We bespeak for it an encouraging support. Published at 13 Court street, Boston, Hotchkiss & Co., \$2 a year in advance.

PELHAM, by Bulwer.—This standard novel has just been republished by Phillips, Sampson & Co. of Boston, and is for sale at Messrs. Stringer, Townsend & Co., corner Ann St. and Broadway, this city—Price 25 cents. Can be sent by mail.

THE NEW ENGLAND FARMER, published at Quincy Hall, Boston, by J. Nourse, commenced its second volume on the first of this month. It is edited by S. W. Cole—he has made a splendid volume for 1849.

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