Scientific American.

NEW YORK, NOVEMBER, 15, 1856.

A Substitute for Leather Wanted.

When rags for the manufacture of white paper were so dear two years ago, the influence of the Press produced quite an excitement in regard to the importance of discovering some cheaper substitute; and had they not become cheaper, no doubt their place would have been supplied, in a great measure, by straw or wood pulp paper. There is another material equally as valuable, and as necessary, which has recently advanced so much in price, that we think it well to direct the attention of inventors to it, to see if they can search out some new invention as a substitute—we allude to *leather*. The value of the 350,000,000 lbs. of paper (at 10 cents per pound) now manufactured annually in the United States, amounts to $35,000,000 per annum, while, at the time the last census was taken the value of the hides and skins manufactured into leather amounted to no less than $40,000,000. Since that census was taken, leather has increased in price about fifty per cent., and has thereby, in proportion, increased the expenses of the people. Leather is a material so universally used, that every man, woman, and child in the country has an interest in it.

In answer to inquiries respecting the reason for this rise in the price of leather, we have been told that increased scarcity of the raw tanning materials and raw materials to be tanned, is the cause. When we find that with the many improvements made in the machinery and processes for tanning during the past few years; and also the application of india rubber and gutta percha to many purposes for which leather was once used, that its price has been steadily advancing, and this on account of the scarcity of cheap raw materials, surely it is time that the attention of inventors was directed to the discovery of some substitute

The material that would answer as a substitute for leather must have peculiar qualities, for on this globe "there is nothing like leather." It is strong and flexible; almost a water repellant, and yet it allows of the escape of insensible perspiration through its pores. For boots and shoes nothing can equal it, and as a material, the finer kinds are really beautiful.

The many purposes for which it is used renders it of great consequence to obtain it cheaply, but knowing the peculiar qualities which it possesses, it would almost appear idle to direct attention to the possibility of discovering a substitute. But as no reasonable limits can be set to the inventive genius of man, we do not know but some lucky inventor may soon hit upon a good cheap substitute, in which case no doubt his fortune will be made, and the community be the gainer.

Sulphur, its Nature, Supply, and Uses.

Sulphur is one of the sixty-two simple substances known to chemists. It is one of the most ancient, as well as the most peculiar elements of which this globe is composed. Its characteristics and applications are varied, curious, and useful. It is found in greatest abundance and nearly pure in some volcanic districts, but is scattered throughout the entire earth combined with other substances, such as in iron, copper and lead sulphurets and various sulphates like gypsum. Pure sulphur is of a pale yellow color, brittle, solid, and insipid; it is a non-conductor of electricity, and a bad conductor of heat. It fuses at 234 degrees, forming a transparent and nearly colorless liquid; as its temperature is elevated, its color becomes paler, until it reaches 482 degs. Fah., when it abruptly becomes dark brown, and in this last state is so thick as to flow with great difficulty. This change in its fluidity is not caused by a change in its density, as it continues to expand with its temperature. If it be thrown suddenly into water while in this condition, it forms a mass which remains soft and transparent for some time after it has become cold, and it may then be drawn into threads, which possess considerable elasticity, and is useful for making casts of medals. From a temperature of 500° to its boiling point—788°—it again becomes more fluid, and if allowed to cool gradually it passes down through the various conditions it assumed in rising, until just before freezing, when it again becomes *very* fluid. These are called "allotropic conditions," and together with its other qualities, have rendered it a subject of peculiar interest to chemists.

It has long been used in medicine, for tipping the ends of matches, and in making gunpowder; but its great and principal use is for the manufacture of sulphuric acid. Soda, which is so much used in the manufacture of glass and soap was chiefly obtained in Spain and France prior to the year 1800, paid about thirty millions of francs for its annual supply. During the war with England, this supply was cut off, and the price of soap and glass rose to a fabulous price, and manufactures suffered in consequence. A great prize was offered by the Committee of Public Safety for a new and cheap method of manufacturing it from common salt—which is composed of chlorine and soda, and Le Blanc, in 1804, invented the method at present pursued, of reducing it first to a sulphate by sulphuric acid, then into a carbonate with the carbonate of lime and coal, and in this state it forms the sal-soda of commerce.

To make soda from salt, it requires 80 lbs. of concentrated sulphuric acid to every 100 lbs. of salt, and it takes 100 lbs. of sulphur to make 300 lbs. of sulphuric acid. When we take into consideration how much is used in making soap, glass, and in bleaching, and for various other purposes, and that it is all made by the use of sulphur, the quantity consumed annually, by all manufacturing countries, must be enormous. And this is not the only great use of sulphuric acid: it is employed extensively in the refining of metals, making stearic acid from tallow and oils, and for various other purposes.

Quite a number of the chemical arts are dependent upon sulphur, not forgetting the india rubber manufactures; and were its supply cut off, soap, glass, bleached cottons, and stearine candles, would soon rise to exorbitant prices. *Hunt's Merchants' Magazine* states that about $20,000,000 worth of sulphuric acid is consumed in our country annually, and France and England consume four times as much. The importance of the sulphur trade is therefore apparent; a cheap supply of it is positively essential to every manufacturing country.

By late news from Europe, we learn that there is a speck of war in the horizon, and it may be that the fleets of England and France will soon blockade the shores of Naples and Sicily. From the latter country the chief supplies of sulphur are obtained, and a war with King Bomba may disturb the trade. We would, however, direct chemical manufacturers to a source of sulphur on this continent, where it can be obtained in as great abundance as in Sicily; that is, in the region of the volcano of Popocatapel, in Mexico. It has been throwing it up from great depths, and in a state of great purity for a number of years, and all the manufacturing countries of the globe might obtain a supply from it. The great expense attending it would be in its transportation through a mountainous region to the coast; but if enterprising Americans had the trade under their control, they would soon construct such roads as would render its carriage easy and cheap.

Were our supply of sulphur from Europe cut off or diminished, our manufacturers would have to look about for a supply from some other source, hence the necessity of directing them to other sources in view of such a contingency.

Curing Sea Sickness.

Dr. Nelkin, of this city who has served as surgeon on board of emigrant ships, has written a work on the subject of sea sickness, in which he states, that different persons are differently affected. The motion of the vessel disturbs the ganglion nerves of some, resulting either in dyspepsia, constipation or diarrhea. All of these ills are cured by the use of mucilaginous and aromatic drinks, or in obstinate cases, by opiates. When the pneumogastric nerves are affected, vertigo and vomiting are generally the results. To effect the cure of this most common and nauseous form of sea sickness, he tried various medicines, and at last selected morphine as the most efficient. He has used it with entire success for dizziness and vomiting. The common dose which he gave was half a grain twice per day. The relief afforded by this narcotic does not last over twenty-four hours; with the return of symptoms the morphine must be resumed. The position most favorable for relief is horizontal—lying on the back.

The most effectual way to cure sea sickness is activity and exposure on deck. This regimen requires the exercise of a determined will, because sea sickness tends to create a lethargetic state of mind, and a repugnance to physical exertion.

American Institute Prizes.

At the time of going to press the award of Premiums at the last Fair of the American Institute had not been made public.

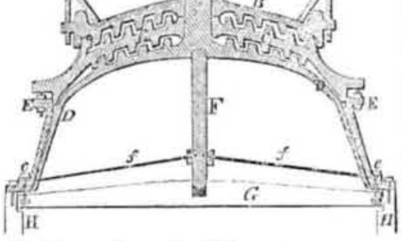
The Exhibition closed two weeks ago last Saturday, and there certainly can be no good excuse for this long delay in announcing to exhibitors the result of the Prize Committee's doings.

The Managers should be aware that exhibitors are impatient to know who have got premiums, and for what they are awarded, and if the Managers are half as solicitous to make the Institute popular among the exhibitors as we are, two serious mistakes made by them this year, we hope, will be in future avoided. The first was in not getting everything in the Palace in order before the doors are flung open to the public. The Managers should set a day on which the goods and machinery must be in their place, and not receive an article afterwards, and from that time let the Exhibition be open.

The second is in keeping the exhibitors and the public so long in suspense as to the result of the awarding committees.

General satisfaction has been expressed in regard to the Exhibition and the Management, and, after correcting a few mistakes, the American Institute Fairs cannot be excelled by any in the world. The receipts this year amounted to $27,610, and have exceeded the expenses by $5000.

Adjustable Grinding Iron Mill.



This figure is an elevated vertical section of a cast-iron mill for grinding grain. It is adjustable and adapted for grinding shelled and cob corn, homminy, oats, &c. A is the hopper; it is secured to the cap wheel, B, by metal straps. The levers for the horse to turn this mill are inserted through lugs in this cap wheel which has teeth or projections on its curved arms extending from its center boss. C is what is termed *a regulator*. It has arms extending from its center, on which there are teeth, and its shell extends down on the outside, and is firmly bolted to the box, H. D is a cast-iron burr; it is formed with a convex top on which are teeth or projections, and its outer sides have grinding projections; also grooves coinciding with like grooves and projections on the inner surface of the shell of C. The burr is of a conical form—dome-shaped. The cap wheel, B, is secured by a nut, *b*, to the neck of the burr spindle, F, so that they both revolve together, grinding the corn between their corrugations and those of the toothed regulator, C. As the burr is conical, the screw bolts EE, regulate, the distance of the space between it and the shell of the regulator, to grind the feed coarse and fine as may be desired.

The spindle of the burr is plumbed or trued by four screw rods, *f f*—two are shown. G is the bridge tree. The cobs or shelled corn being fed into the hopper, they are first crushed between the top projections, and thus the grinding has not all to be performed on the sides, as in some other mills; the sides of the mill do the fine grinding, and thus the operation goes on in a gradual and uniform manner from first to last. The plumbing rods, *f f*, set all the grinding surfaces true to one another; and as all cast-iron mills are liable to warp, and thus cause the dress or grinding surfaces to wear untrue, and wear out quick, this method of regulating the position of these surfaces is an excellent compensation improvement.

This mill is simple, strong, durable, and not liable to get out of order. Patented Dec. 25, 1855. For more information. address the patentee, Thos. B. Stout, Keyport, N. J.

Telegraphing under Water.

Electricity is a curious agent, influence, or call it by what name we please. It runs along metal wires and writes away from New York to Washington quick as thought. But just break its frail metal road, and put a handsome silk cord of half an inch in length in place of half an inch of the wire, and lo he will not walk on it a hair's breadth; down goes his writing pen, and if he refuses to walk on silk, he is not slow in going into the *sulks*.

A very peculiar feature of electricity, in connection with submarine telegraphing, was discovered by Faraday, shortly after the telegraph cable was laid down between England and Holland. At first it would not operate; and as it was a well constructed cable—carefully insulated and laid out, the difficulty was unexpected, and could not be accounted for. Faraday was consulted, and he found that the conducting property of sea water on the outside of the coated wire converted it into an elongated Leyden jar, and caused it to retain a portion of the charge, in the same manner as an ordinary Leyden jar retains a part of the electricity after it has been discharged. This difficulty, in which the electric current traverses continuously in the same direction was overcome by reversing the direction of the current after each signal, by which process the wire was prepared to transmit another. That plan has answered from London to the Hague, and no doubt will be effectual to transmit news from New York to London.

Crediting News.

The *Boston Herald*, of the 3rd inst., in an editorial, gives rather a curious reason why so many articles are copied from our columns without credit, viz. that we *lead* all of our articles, and that other papers do not know whether to give us credit or not, because it is a custom with other papers *not to lead* copied articles. The Editor therefore requests us not to lead the small articles in our columns that we copy from other papers. Really we do not see into the philosophy of this request, nor into that upon which the article is based. When we copy an extract from another paper, we put it in inverted commas, whereby every person acquainted with literature can understand its authority. There is no paper more ready to give credit to other sources of information than the SCIENTIFIC AMERICAN, but nearly all our matter is entirely original. The editor of the *Herald* may rest assured, that it is a positive fact, that almost *every one* of the notices of new American and foreign inventions which appear in various papers, are taken from our columns: "Hardly a day passes but we are greeted, in the papers, with some re-hash of an old article on 'very recent' discoveries, the original particulars of which appeared years ago in our journal."

SPLENDID PRIZES.—PAID IN CASH.

The Proprietors of the SCIENTIFIC AMERICAN will pay, in *Cash*, the following splendid Prizes for the largest Lists of Subscribers sent in between the present time and the first of January, 1857, to wit

For the largest List,	$200
For the 2nd largest List,	175
For the 3rd largest List,	150
For the 4th largest List,	125
For the 5th largest List,	100
For the 6th largest List,	75
For the 7th largest List,	50
For the 8th largest List,	40
For the 9th largest List,	30
For the 10th largest List,	25
For the 11th largest List,	20
For the 12th largest List,	10

Names can be sent in at different times and from different Post Offices. The cash will be paid to the order of the successful competitor, immediately after the 1st o January, 1857.

☞ See Prospectus on last page.