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THE BOILING OF WATER.

Under the above heading on another page, we republish an interesting article from the *Providence Journal*. It was forwarded to us by a correspondent in that city, with the request that we would "give our views upon the subject." It states that water deprived entirely of air may be heated above 212° without boiling, and when heated above 220° it will boil with great violence when disturbed. Some steam boiler explosions are thus attributed to water in the boilers being entirely deprived of air. In explanation of this phenomena it is stated in the article that steam is condensed in such water, and confined in it, like carbonic acid gas in soda water. This theory is atttributed to Mr. C. Wye Williams (of Liverpool, England), the author of a treatise on heat and steam. We have been somewhat acquainted with the views of Mr. Williams on this subject. The fact that water when deprived of air is capable of resisting ebullition until it has acquired a temperature much about 212° (at which common water boils) was not discovered or first presented by Mr. Williams. His views of the cause belongs to himself, but these may be erroneous. On page 357, Vol. V. (old series), of the SCIENTIFIC AMERICAN, we gave an account of Professor Donney's discovery that pure water devoid of air could be heated without boiling to 300°, then flash into vapor; and we said at the time: "May not this discovery account scientifically for a great number of boiler explosions?" Since that period all good works on chemistry contain remarks on this subject. In Professor Miller's "Elements of Chemistry," published in London, 1860, he says on page 246, Vol. 1: "The experiments of Donney have thrown light upon some of the causes by which ebullition is facilitated. He has found that the presence of air in solution singularly assists the evolution of vapor. From the increased elasticity which the dissolved air acquires by the addition of heat, minute bubbles are thrown off in the interior of the liquid, especially when it is in contact with a rough surface, and into these bubbles the steam dilates and rises. By long boiling of the water, the air becomes nearly all expelled; in such a case the temperature has been observed to rise as high as 360° in an open glass vessel, which was then shattered with a loud report by a sudden explosive burst of vapor. In this case the force of cohesion retains the particles of the liquid throughout the mass in contact with each other in a species of tottering equilibrium, and when this equilibrium is overturned at any one point, the repulsive power of the excess of heat stored up in the mass, suddenly exerts itself and the explosion is the result of the instantaneous dispersion of the liquid."

The explanations of the phenomena by Professor Miller and Mr. Williams are quite different, but this is of minor importance—the fact remains the same. Professor Donney's discovery does indeed afford a plausible explanation of some mysterious boiler explosions. The information is useful to all engineers and other persons who use steam boilers.

SOME 10,000 lbs. of peanuts were raised in Yole and Sacramento counties, Cal., last year.

LEX TALIONIS.

It is almost a work of supererogation to say anything about the inefficient manner in which our navy is conducted; the past has shown the truth of this assertion, and every day is continually adding to its force. In view of the fact that the rebels are now building ten iron-clad war vessels of all classes in England, it seems well to consider what means shall be adopted to prevent them from injuring our trade if not driving us from the ocean. Ten well-built war vessels can do a great deal of mischief provided they are managed like the *Alabama*. That ship would stand a very poor chance with our new-sloops-of-war, if they were able to catch her, but her rebel commander shows commendable prudence in using his heels instead of his guns.

Since the Navy Department seems inadequate to the task of checking the ravages of the pirates, some other method must be tried to preserve our commerce and retain, as far as possible, some show of resistance. These means are letters-of-marque; for from a once great power the navy, through the incompetents who sit at the helm, has lost much of its prestige; and the only reports we receive are of trial trips, or of the loss of new ships almost untried. As we cannot expect that the "old man impotent" will be removed from office, we can only turn in our strait to that saving element—our merchants as represented by the Chamber of Commerce. They can take some action in the matter that will save our traffic and redeem our name. There are daring spirits in the navy who burn with ardor and who possess unquestionable capacity, but being controlled by some influence unseen, although not unknown, they spend their time idling at home cruising on useless expeditions, or riding at anchor, wearing away their patience in blockading duty.

When Washington Irving wrote the *parable* of Rip Van Winkle, he must have known that Secretary Wells would one day be at the head of the navy, and that he would, wrapped in profound unconsciousness, suffer the golden minutes and opportunities for national distinction to pass unimproved, while the time and tide, which might bear him on to renown, were passing away forever. Instead, however, of the rusty fire-lock that the Secretary's prototype was furnished with, there should be a ponderous anchor stock, with a fouled cable attached, as the insignia of a useless incumbent on the shoulders of the people.

Although privateering is not the most desirable system of naval warfare, yet in view of the circumstances, there would seem to be no alternative. When we read in English papers, and receiveadvices as we do continually, that our disinterested well-wishers in the mother-country are building vessels for the Confederates, we think it about time for the merchants to protect themselves, and try what individual or collective enterprise can do toward ridding the sea of those pests that now prey upon our commerce. It is idle to say that no such vessels are being built—the *Alabama* is a complete refutation of such assertions. It was well known in this country that he was in course of construction, and the Navy Department sent the *Tuscarora* to intercept her; but, through the connivance of our enemies abroad, the mission failed. No such obstacles could hinder the cruisers manned and fitted out by the Chamber of Commerce; and we predict a speedy disappearance of the anglo-rebel pirates, should an efficient vessel and a picked crew be sent to search for them.

PAPER AND CLOTH FROM INDIAN CORN HUSKS.

Among the various substances which have been proposed and tested as good substitutes for cotton and linen rags in the manufacture of paper, a decided measure of success has been achieved in Austria by the use of the husks of maize (Indian corn). We have received from Chevalier Loosey—the Austrian consul for this city—several specimens of paper, fiber and a piece of coarse cloth, all made from the husks of maize at the imperial paper mill, Schlögelmühle, Austria, under the superintendence of Dr. A. Auer von Welsbach. The samples comprise varieties of thin and stout printing, wrapping and other sorts of paper. They are all strong and beautiful and much resemble some kinds of linen paper. The manufacture of these products is now carried on at Schlögelmühle, and Dr. Auer has published an account of its progress which we will present as briefly as possible:—

Paper had been made from maize straw in the last century in two Italian paper mills, but not with profitable success, and further attempts were soon abandoned. In 1856, Moritz Diamant, of Bohemia, took up this subject again and agreed with Baron Bruck, then Minister of the Finances at Vienna, to make a certain quantity of paper from maize straw at the imperial paper mill, and he was successful, excepting in its cost, which was greater than that made of cotton and linen rags. In 1859, he made a second trial, and, although he made various kinds of good writing and printing paper, the cost was still too great, and its manufacture could not be undertaken upon an extensive scale. This was the condition of the case in 1860 when the director of the imperial paper mill at Schlögelmühle, knowing that good paper had been made of maize fiber and believing that improvements might be made to reduce its cost, instituted other experiments, the results of which we now have in the production of the paper, fiber and cloth to which we have alluded. The spinning and weaving of the maize fiber are not yet so far advanced as the manufacturing of paper; but this is easily accounted for by the fact, that the processes for making the paper have been tried for several years, while the spinning and weaving of the fiber have been tried only for a space of six months.

The components of the maize husks are separated into three different parts in the process that is applied to obtain the fiber. These three parts consist of fibers, flour-dough and gluten. The fibers are spun and woven into cloth, the flour-dough is a nutritive substance which will remain fresh in the open air for months and of which good bread has been made by mixing a certain portion of wheat flour with it. The short loose fiber and the gluten, which are precipitated during the process of preparing and cleaning the fiber, are used for manufacturing the paper, and several large documents have been printed on this paper at the imperial printing office in Vienna. The maize or Indian corn plant thus yields corn as food for man and beast, and from its husks cloth and paper may also be made. In these products of the corn plant a new branch of industry appears to be presented to our people, for in no other portion of the world are such immense quantities of maize raised as in the United States, and no where else does the plant attain to such perfection.

Specimens of the Austrian maize paper and fiber may be seen at the office of the SCIENTIFIC AMERICAN.

PATENT OFFICE APPROPRIATIONS.

The last Congress made the following appropriations for the Patent Office Department:—

For expenses of receiving, arranging and taking care of copyright books, charts, and other copyright matter—$1,800.

For preparing illustrations and descriptions for report—$5,000.

For finishing the saloon in the north wing of the Patent Office building, and for furnishing the same with suitable cases and accommodations for the reception and convenient exhibition of models—$50,000.

For repairing and painting the saloon in the old portion of the Patent Office building, and for furnishing the same with suitable cases and accommodations for the reception and convenient exhibition of models—$25,000.

An appropriation was also made for printing 30,000 copies of the Patent Office Reports for the years 1861 and 1862. The plan of illustrating the reports (which rendered them so valuable) was discontinued at the close of 1860; and under an act of Congress the Commissioner of Patents undertook to print ten copies of *each* of the descriptions and claims of all patents and ten copies of each of the drawings. After an expenditure of $50,000 this practice was abandoned as too expensive. Congress has now authorized a continuance of the illustrated reports, as heretofore, which will include those of the years 1861 and 1862. The illustrations for these works will be done at the establishment of E. R. Jewett, of Buffalo, N. Y., who so admirably executed some of the later reports.

THE New Bedford (Mass.) Cordage Company have made a manilla-hemp hawser, 14 inches in girth, 960 feet in length and weighing 5,600 lbs., to be used for hauling off the steamer *Caledonia* which lately went ashore on Cape Cod.