

Scientific Museum.

(For the Scientific American.)

American Sponges and Florida Salt.

In your valuable paper of the 12 inst., in an article headed "Bahama Sponges," you make the query, "could not the sponge-fishing be pursued along the coast of Florida?" and knowing your anxiety to keep posted up in relation to the industrial pursuits of the whole country, I take this opportunity to inform you that, within the last nine months, there has been exported from the Port of Key West some \$17,000 worth of sponges, and the business is daily increasing here in importance. The first start made at this kind of fishing took place not more than one year ago, and it now occupies the entire attention of that class of the population here that go by the name of "Conks." They are the descendants of refugees or Tories who emigrated from North Carolina, during the Revolution, to the Bahamas, and who have been returning continually to the United States since the Emancipation Act began to take effect in the British W. I., in 1833. At this time there are about 1500 of that class on this Island, and they are, in their way, industrious and frugal, but I do not think that they will set the Gulf of Mexico on fire with any extraordinary enterprise; however, they are orderly and quiet, and make the best divers and fishermen that we have here. On the whole, they are among our most useful citizens.

The wrecking vessels, likewise, which belong here, have begun, many of them, to join "sponging" with that of their regular business.

By the way, there is a business pursued on this island which promises to be of considerable importance hereafter: I mean the making of salt by solar evaporation, which is now carried on to a small extent, but could easily be increased a thousand fold, as the natural salt ponds are sufficiently extensive for the purpose.

The business was commenced before the destructive hurricanes of 1845 and 1846, which laid everything in ruin about the ponds, and which so discouraged the proprietors that they sold out; but they had done enough to convince the judicious that the business could be made profitable by the right management, as the salt is of a superior quality, and the solar heat, joined to the Trade Winds, possess great evaporative powers. The present proprietors are making improvements slowly, and of such a character that a hurricane will not be likely to destroy them; and I should think that they now make from 30,000 to 40,000 bushels of salt yearly, which would be sought after if its superior qualities for packing meats were generally known.

The writer of this, two years ago, took some of the "Key West Salt" with him to Alabama, where he resides, and where he had been much troubled to keep meat in the summer, whenever he killed a small hog or beef, and he does not remember of losing a pound of meat while he used this kind of salt.

The kind of salt used at the South or South West, is generally the kind brought from Liverpool, is evaporated by boiling, and which, of course contains all the impurities in both the mineral salt and the sea-water used to dissolve it in the manufacture of the article; except such impurities as epsom and glauber salts, which are more soluble than common salt, and which are easily separated from that article by being drawn off in the form of "bitterns;" but the muriate or sulphate of lime, or the muriate of magnesia is crystallized with the muriate of soda (common salt), or with it hopelessly incorporated. Now, in a table of the constituents of sea-water before me (for its correctness I do not vouch), in some instances the three above named impurities, combined, bear a ratio to common salt of 111 to 285,—nearly 50 per cent. However this may be, it is certain that not a barrel of meat used by the British army or navy, or the commercial marine, for long voyages, is salted with salt made anywhere in the British Islands; "Bay (solar evaporated) Salt" alone is

used, which is procured from France or Portugal, and John Bull sends here innumerable cargoes of his impure salt to taint our meat, and we are the gulls that buy it.

In Key West great care is taken to get the "pickle" to the strength requisite in the "reservoirs," to deposit all the crystals of those three named impurities there, before it is pumped into the "pans" where the salt is crystallized. This leaves the salt nearly pure, as the bitterns are easily drawn or washed off.

The American Encyclopedia, in the article on "Salt," says that the muriates of lime and magnesia and the sulphate of lime, which are always present in common salt, when evaporated by boiling, not only injure the salt to the amount of the weight of those impurities but that they materially injure the antiseptic powers of the remaining pure salt. Will not some of your numerous correspondents, who are practical chemists, test the antiseptic qualities of different kinds of salt or give us the results through your columns? I think it is of importance to health that we should eat sound instead of tainted meat. By the way, England is very careful not to buy any of the meat salted here with the salt she sends us.

Key West, Fla. D.

For the Scientific American Hydraulics.

(Continued from page 280.)

GREAT POWERS ON HIGH FALLS.—We last week presented two engravings of the plan proposed by Mr. Parker for applying his wheels to high falls, and thereby bringing into useful action the immense water powers in some districts of country, where they are now dashing down expending their noisy strength upon crags and jutting rocks. It is a plan which appears to be perfectly practicable, and whereby the mountain torrent may be made to forge an anchor or to shape a pin. We do not present any engravings this week, but will let Mr. Parker give his own opinions upon the engravings we presented last week, to which we would refer our readers as they read the following:

The representations given are the deductions of long experience and much careful investigation; and as the principles upon which they are based have been fully tested in a practice of many years, they may be safely considered as reliable. That this improvement ranks with the best known in regard to economising water, has been fully proved by several carefully made scientific tests, and in many instances in practice, where they have been substituted for gravity wheels; and that they are superior to all others in durability, freedom from accident or disarrangement, steadiness of motion, convenience of management and superintendance, the smallness of the space they occupy, and cheapness of construction and maintenance, particularly where great powers are required, there can be no doubt with such as will investigate the subject.

With the arrangement represented, the transmission of high powers and velocities by belts, so far as tried, has been perfectly successful and satisfactory. A considerable number of mills, so arranged, have been running from two to five years, and in no instance has there been any trouble or expense in maintaining, constantly, their perfect working condition. The capability of a belt of any given strength and tension to transmit mechanical power from one axle to another, being directly as its velocity, the high speed attained in this improved method, enables one of moderate strength and tension to communicate a great amount of power. And as the power may be taken from both ends of the shaft of the wheel, and any number of belts be used, any amount of power that a wheel can be made to give, can be transmitted by this simple and easy method directly from the axis of the water wheel to the several parts of the machinery to be propelled. In regard to the durability of belts used in this way, our experience has now fully proved that when made of good leather, in a proper manner, they will remain in good order in constant use, for years, with a working tension of fifty pounds for each inch of their width; and an increase of speed to any extent yet tried, makes no apparent difference in their durability.

On falls greater than 35 or 40 feet, it will generally be found most convenient to place the axis of the wheel about 24 feet above the surface of the lower level; and for this reason they are so represented in the engravings. It may, however, be placed at any convenient height not exceeding 30 feet; the effect of the whole fall being the same, (if the air is perfectly excluded from the draft-chambers and tube), that it would be if the wheel were at the bottom of the whole descent. When the wheel is thus elevated in a sufficiently capacious cavity, from which the air is entirely excluded, and out of which the water, passing through and from the wheel can freely and slowly pass at the bottom, the pressure of the atmosphere on the surface of the head water becomes effective in giving velocity and force to the water, in its passage into and its action on the wheel, in addition to that due to the actual head above the wheel, to an extent equal to a column of water of a height equal to the elevation of the wheel above the lower level. For example, as the atmospheric pressure on the surfaces of both head and tail water is constantly nearly 15 lbs. for each square inch, which is sufficient to raise a column of water in a vacuum nearly 34 feet high; if the wheel be placed in such a cavity, 17 feet above the surface of the lower level, the atmospheric pressure on the upper level will be made available to the extent of half an atmosphere, or 7½ pounds per square inch, which is equal to a head of water of 17 feet; and this will be in addition to the pressure of so much of the whole fall as there may be above the wheel operating as head. The same rule will hold good till the wheel is placed at a height of 34 feet or more above the lower level,—where the whole atmospheric pressure is made available on the upper level. An elevation of the wheel above this point cannot increase the atmospheric pressure on the upper level; it will therefore cause a loss of so much of the whole descent as there may be between the wheel and the top of the column of water sustained in the vacuum by the pressure of the atmosphere on the lower level: thus, if on a total fall of 64 feet, the wheel were placed 44 feet high, there would be a loss of 10 feet of the fall: because there would then be a height of 10 feet of perfect vacuum, through which the water (even the most minute particles) would fall with the velocity due to falling bodies.

Great advantages in efficiency, durability, and economy are anticipated from making the entire structure (except the walls) of metal; as besides the greater durability and stability of the materials, it will induce a much more perfect style of workmanship in the arrangement and finish of the parts than has hitherto been attainable.

The great statical pressure of the higher heads in the cylinders and on the disc and cover of the penstock, can, with proper attention, be sustained without difficulty, as besides the great strength of the materials of which they are proposed to be made (in the form most favorable for strength), any number of binding rods and bolts may be inserted when required without detriment to the efficiency or convenience of the machine.

The cost of a wheel of 1320 horse-power, and 100 feet fall, as represented last week, will be about \$18,592, or at the rate of \$14.80 per horse-power.

Sugar Refining Machinery.

At the present moment there are being constructed at the Novelty Works, this city, four copper vacuum pans, the largest ever seen in this country, each weighing over four tons, and being 8 feet 6 in. in diam., and capable of containing 2,000 gallons. They are constructed, also, on a new and improved plan; have double bottoms, and being lined with long coils of pipe, which allow of the application of steam to the boiling of the sugar. An air pump, worked by steam, draws off the vapor arising in the pans; while the sugar itself is dissolved in water. All risk of burning is avoided by the boiling point being obtained at a low temperature. Each pan is provided with a thermometer; a gauge to exhibit the extent to which the air has been exhausted; a proof-stick to enable the boiler to test, at any

time, the condition of the mass; and an eye-glass which affords a view of the interior of the pan.

LITERARY NOTICES.

MANUFACTURE OF STEEL: By Frederick Overman, published by A. Hart, Philadelphia.—Mr. Overman is the author of a splendid work on the "Manufacture of Iron," another on "Practical Mineralogy," all published by the same house. He has devoted his attention to metallurgy in all its branches. This work is not only devoted to the manufacture of the steel, but the different methods of working in it, such as forging, making of anvils, fluxes for welding, testing steel, &c. It is a hand-book to the blacksmith and all workers in steel and iron. We consider it to be an exceedingly useful book, and well worthy the patronage of all interested in iron work.

MILLER AND MILLWRIGHT'S ASSISTANT: Published by C. Baird, of Philadelphia.—The author of this work is Wm. C. Hughes, of Michigan, a practical man. It treats of Water Wheels and the Power of Water, especially as applied to Re-action Wheels. It treats of the friction of machinery, &c.; it also treats of the culture of grains and the different kinds of stones for grinding wheat and corn. It is very particular in its directions for dressing and laying the stones. This is the best part of the book, and is exceedingly practical and useful. It is just the book wanted by our millers, and no one in our country should be without it.

DICTIONARY OF MECHANICS AND ENGINE WORK.—No. 29 of this able work, published by D. Appleton & Co., New York, contains articles on the "Mental Kingdom," "Moulding Machinery," "Self-Acting Mule," "Nail Machinery," "Needles," and a view of "Byram's Oscillating Engines," and "Paper Machinery;" Byram's English Oscillating Engines are far inferior to some now running in our city—American engines.

ICONOGRAPHIC ENCYCLOPEDIA.—Part 19 of this useful and beautiful work is now published and ready for sale by Mr. Rudolph Garrigue, No. 2 Barclay st., it contains plates from 18 to 37 of the work, representing the various orders of architecture. The illustrations of this work really entitle it to be named "Iconographic," for it is a book of pictures in every sense of the term.

PETERSON'S LADIES' NATIONAL MAGAZINE, for June, is for sale by Messrs. De Witt & Davenport, Tribune Buildings. It contains sprightly engravings of "Ghost Stories," "Fashions," etc. Peterson, Dana, Chivers, Mrs. S. S. Smith, are among the contributors.

The last number of the **DRAMATIC WORKS OF SHAKESPEARE**, by Phillips, Sampson & Co., Boston, is issued; it contains the tragedy of "Othello." The publishers announce, in a special notice, that owing to the sickness of the engraver, the portrait of Desdemona could not be executed, and that it will accompany part one of the Poetical Works, which they will issue in about ten days. We commend this work to the attention of our readers as the most complete and valuable edition ever published. Price 25 cents. De Witt and Davenport, agents.

NEW YORK NEWS LETTER.—This is the title of a new and very neat little paper, printed on a large sheet of good post, and containing a summary of all the news of the week, state of the markets, and so on. It has one blank side for writing upon, so that it is very convenient for merchants and others writing to their friends. It is published by J. E. Phillips & Co., 120 Water st.

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