Correspondence.

The Purification of Salt.

To the Editor of the Scientific American:

Allow me to call your attention to an error in the article concerning the purification of salt in your issue of October 13. The purpose is to clear the salt of the *chlorides* of calcium and magnesium, and not of the *sulphates*. The first named chloride being deliquescent causes the salt to attract moisture, and the latter gives it a bitter taste. Neither should be found in a good article of dairy salt.

SAMUEL S. GARRIGUES,
Late State Salt Inspector of Michigan.
Ann Arbor, Mich.

The New Iron Wharf at Fortress Monroe, Va.

The new wharf or pier at Fortress Monroe, Va., for which there has been made an appropriation of $175,000, is now in process of construction.

The parties to whom the contract was awarded are the Groton Bridge and Manufacturing Company, of Groton, N. Y.

What the United States wants such a large pier at Fortress Monroe for has often been a matter of conjecture, and the question is perhaps unanswerable. At all events, the work was started last July, on what will be the largest pier, of its kind, in this country.

The length of iron wharf from shore bulkhead to face will be 320 feet, and the width 250 feet. Outside of this will be two bays of wooden piles, to act as a shield to protect the iron from the shock of heavy vessels, making the wharf twenty feet larger all around.

The piles are all cast iron cylinders, made in one, two, and three sections, varying in diameter, 8, 10, and 12 inches respectively, and of one inch metal.

The lower sections are 12 inch cylinders, 7 feet in length, with a screw flange of 12 inches at the lower end. They are to be screwed down over wooden piles, driven at 14 feet centers, and which are cut off level with the bottom.

The iron pile is screwed down until its upper inside flange rests securely upon the wooden pile, the screw flange being about 6 feet under the sand.

As the upper sections are also of the same length, it is the middle section that varies, according to the depth of water the pile is placed. At the bottom of the upper sections will be the low water bracing, of one inch round iron diagonal rods.

On the inshore portion, in water of 10 feet and under, are disk piles, mostly of one section, with a 3 foot disk for a bearing.

These are put down by means of water jets, one inside the pile, which has a 2 inch hole in the bottom, and one on the outside to guide it straight, cutting the sand away on the sides, where is the most resistance.

The reason for using wooden piles under the cast iron ones is owing to the formation of the bottom. An idea of this can be had by imagining the bottom of Hampton Roads to be a level plain of sea mud, and its sandy shores beginning say at three fathoms and rising gently at an inclined plane until above low water.

The consequence is that the outside piles, numbering about 500, have not sufficient sand under them for a bearing.

The upper sections will be filled with beton.

The deck beams and upper bracing will be 8 inch and 12 inch I beams, with 7 inch beams for cross bracing. These will be of steel.

The wharf will have seven landings, four 140 feet, one 150 feet, and two 60 feet in length, and will accommodate all the bay line and river steamers.

T. J. HAINS,
Formerly Inspector in Charge.
1824 Jefferson Place, Washington, D. C.

Effect of the Loco Weed in Oregon.

To the Editor of the Scientific American:

In the SCIENTIFIC AMERICAN of October 13, under heading of "Natural History Notes," you speak of the "loco" or "crazy weed" of Texas and that its reputed power of producing insanity and death has been proved unfounded. This assertion of the innocence of the "loco weed" I cannot contradict; but the fact of a certain weed (by some called the "loco") that grows on the Columbia River bottoms, between the "Cascades" and "The Dalles," that will cause temporary insanity in horses not accustomed to feed on the bottom lands, is too well known to doubt. Although I have never seen an animal directly under the influence of the weed, yet I have seen them immediately afterward, and the signs were unmistakable—the animal with his head and fore legs bruised and bleeding, the stall, manger, and feed boxes totally demolished, and everything denoting a terrible struggle. Almost every farmer occupying bottom lands will tell you the same story, not among his own stock, as they are accustomed to it, but of neighbors' teams from the uplands, that occasionally put up over night and feed of new lowland hay. The teams are watered and securely tied in their stalls and bountifully fed on the bright soft hay from the overflowed lands. About midnight the owner is awakened by a terrificuproar in the stables. Hastening thither, the teamster is astounded to see his horse or horses in a perfect frenzy of madness, rearing, striking, biting, and kicking. Nothing, however, can be done until the effects of the weed pass off, and morning finds the horse, if he has not injured himself, but little the worse for his night's antics. What weed this is I do not know, nor have I ever found any one that could positively say that they knew, but it is certain that there is something in the new cut bottom hay that will cause temporary insanity in horses. It is no uncommon thing to see a man driving a horse with a bruised and swollen head, and, upon inquiring the cause, he will answer, "Oh, I was down on the bottoms last night, and my horse got a dose of crazy weed." Whether this is the famous "loco weed," or whether it is confined to this locality, is beyond my "ken." I should like to hear from others.

H. C. COE.
Hood River, Oregon, October 23, 1888.

America Ahead in Astronomical Instruments.

Professor John A. Brashear, who has just returned from Europe, declares, through the *Pittsburg Chronicle*, that the United States, in the manufacture of astronomical instruments, is far ahead of every other country in the world.

In speaking of his trip the Professor said: "We had a very pleasant time, and I saw some astonishing things, and was treated with great courtesy wherever I went. I visited the Royal Institution at London and all the colleges at Cambridge, and had a very pleasant talk with Professor Adams, who was the discoverer of Neptune, and one of the most eminent astronomers in the world.

"The Paris Observatory is doing special work in photographing the stars. There is not much being done at the Geneva Observatory. The most important and interesting work is being done at Potsdam, near Berlin. They have the finest observatory in the German empire. I visited the laboratory of Dr. Schumann, at Leipsic. They are doing the finest work in photographing the spectrum of the gases. At Hamburg I met the great Dr. Newmeyer, who has charge of the meteorological and nautical observatory, the greatest in the world. Here sea captains from every part of the globe receive instructions for their different voyages. Storms, currents, and ocean and atmospheric temperatures are all recorded from data obtained from those who have sailed the different seas and oceans of the world.

"I also visited the observatory at Hamburg, and was shown some very interesting instruments. I visited the astronomical works of Sir Howard Grubb in Dublin. He has made some of the largest telescopes ever manufactured. When in France and Germany, I found them holding to many of the old methods of working, while Professor Grubb was more like a genuine Yankee, making steam do most of the work which is done in the other countries by hand and foot. I feel very many times repaid for my visit."

[PROCEEDINGS OF THE ENGINEERS' CLUB OF PHILADELPHIA.]

The Manufacture of Sewer Pipe by the Delaware Terra Cotta Company.

BY FREDERIC H. ROBINSON.

The works are situated on Brandywine Creek, between Heald and Eleventh Streets, and close to the Philadelphia, Wilmington, and Baltimore Railroad. They are equipped for the manufacture of all the standard sizes and shapes of sewer pipe, as well as of other work in terra cotta, and of fire brick.

The material of which the pipes are made is composed of three ingredients—two kinds of clay and a sand and clay mixed. The first is a very strong clay obtained from brick yards in the northeastern part of the city. It underlies the clay of which bricks are made. The second is a strong clay containing a red coloring matter, and is obtained from the south side of the Christiana River in New Castle Hundred, near the bridge on which the Delaware Railroad crosses the Christiana. The third ingredient is a material composed of fire clay and sand, and is obtained on the Christiana River in New Castle Hundred. These ingredients are mixed in the proportion by measurement of two parts of the strong clay first mentioned, one part of the clay containing the red coloring matter, and one part of the fire clay and sand. Made in these proportions, the mixture is placed in the wet pan, where water is added. The wet pan is a shallow circular iron pan, in which the clays are crushed and mixed by two iron wheels, following each other on edge around the pan, driven by a horizontal axle attached to a vertical shaft. This pan is placed on the ground floor.

After the materials are properly mixed, this clay is turned by a suspended shovel into the buckets of the elevator, which are attached to an endless band, in which it is raised to the third floor of the building.

Projecting from the third floor toward the second is the casting which contains the iron mould for the pipe. Into this the clay from the wet pan is thrown, and an iron plunger, moved by the piston of a steam cylinder, which piston is attached to the upper end of the plunger rods, descends vertically, compressing the clay in the mould below.

After the clay is thoroughly compressed in the mould, an iron table under the mould, attached to the upper end of a piston passing below the second floor, and forming, as it were, the bottom for the mould, descends with the pipe standing upon it. The alternate upward and downward motions of the piston which moves the plunger, and the piston which moves the table, are controlled by the operator on the second floor, where the pipes are removed from the mould.

Pipes under five inches in diameter are, when taken from the mould, immediately removed to another part of the second floor, where they have placed in them a wooden frame of the proper length, to which their ends are trimmed off and then smoothed with leather. As those over five inches in diameter come from the mould, they immediately have their spigot ends trimmed off, and are then taken by an elevator to the first floor, where their ends are finished up. These, with the smaller pipes from the second floor, are placed on end on the drying floor of the first story of the building, where they remain from three to six days, when they are ready for burning.

Branches are made by placing the branch piece, while damp, upon the main pipe, and then trimming and shaping them.

Traps are formed by hand in plaster of Paris moulds, which are made in halves, dividing lengthwise.

The walls of the kilns are of brick and are 13 inches in thickness. The kilns are circular, the largest being, inside, 22 feet in diameter, and 8 feet high to the square, surrounded by a dome.

The kiln is filled with pipes from the drying floor, placed on end. It is fired from eight fireplaces at equal distances around the kiln. Gas coal is used. Inside, the products of combustion pass through short vertical stacks toward the top of the kiln, whence they are beaten back among the pipes, and finally escape through a flue built around the kiln near the bottom, and pass in an underground flue to the stack.

At the proper stage of burning, which is ascertained by small test pieces of clay which may be drawn and examined, the attendant passes three times around the kiln, and each time throws into each fireplace a shovelful of common salt. By this the pipes are glazed.

After the sealing of the kiln, three days are required in which to fire up and burn, and three more in which to cool off and remove the pipes, which are inspected and are then ready for the market.

A Light of Seven Millions of Candles.

A correspondent of the *Times* calls attention to the new light now shown from the St. Catherine's Point lighthouse in the Isle of Wight. Prior to May 1 of this year the light exhibited at this station was described in the Admiralty list of lights as fixed, dioptric, of the first order. That is, it was a steady light produced by means of a six-wick concentric oil burner and refracting lenses, the intensity of the naked flame being equal to about 730 candles. At the present moment an electric light is being shown at St. Catherine's, the full power intensity of which was recently stated by Captain Sydney Webb, the deputy master of the Trinity House, to be equal in illuminating power to rather more than 7,000,000 candles. Every half minute, in fact—for the light now revolves—a mighty flash of five seconds' duration sweeps around the sea, and is visible at distances that seem incredible. To effect this improvement a commodious engine room has been added to the establishment, containing three steam engines of 12 horse power each and two magneto-electric machines of the De Meritens type. Two of the engines are intended to work for lighting purposes, the third being meant to work the fog signal. As a precaution against break-down, everything is in duplicate at least, with an oil light in reserve as well. The only other lighthouses on the coast of England at which the light is produced by means of electricity are Souter Point, on the coast of Durham, between the mouths of the Tyne and the Wear; the South Foreland; and at the Lizard, on the Cornish coast. But the St. Catherine's light is ten times more powerful than the best of them, the one on Souter Point. It is, in fact, one of, if not, as is believed, actually the most intensely brilliant light in existence, and one which the country as a maritime nation may certainly feel proud to see on its shores.

Is Cheap Quinine a Blessing?

The *Medical Record* is not so sure that cheap quinine is such an unalloyed blessing. It has come about that nearly every family now has its quinine bottle, that it is sold at many general stores, and that the doctor rarely meets an invalid who has not been thoroughly dosed with quinine.

The drug, when taken continuously or excessively, is an injurious one; and its therapeutic value is greatly exaggerated in the popular mind. The value of quinine in "colds," bronchitis, ephemeral fevers, anorexia, general malaise, and various other minor ills, the editor thinks, is most problematical.

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