

SCIENTIFIC MUSEUM.

Scientific Memoranda.

MANUFACTURE OF SALT IN ENGLAND.—There are ninety-seven establishments in England, mostly in Cheshire and Worcestershire, which manufacture salt. These works produce on an average 800,000 tons of salt per annum, of which one-half is exported to the United States and Canada, the Baltic, Scotland and Ireland, and the remainder is consumed at home in alkali manufactures, for domestic purposes and as manure. The town of Newcastle-on-Tyne consumes 70,000 tons annually.

PUMPING OUT THE HARLAEM LAKE.—The pumping out of Harlaem Lake is approaching its end; already it is so low that ditches have to be dug in the bottom to lead it under the pumps, by which the three large steam engines suck it out; 30,000 acres of good land will be made by the operation.

This lake is in Holland. An engraving of the engines used for pumping it dry is published in Vol. 2 Sci. Am.

NEW SUSPENSION BRIDGE.—The wire suspension bridge at Fairmount, Va., will be over the Monongahela, about one hundred miles from the Ohio, and more than fifty above any ordinary steamboat navigation. The Wheeling Gazette says that Dewey & Co., of that city, have the contract for the wire of this bridge, and also one over Elk river, at Charleston.

TO MAKE HENS LAY.—The South Carolinian says, a neighbor states that hog's lard is the best thing that he can find to mix the dough he gives to his hens. He says that one cut of this fat, as large as a walnut, will set a hen to laying immediately after she has been broken up from setting, and that, by feeding them with the fat occasionally, the hens continue laying through the whole winter.

GLASS COFFINS.—The Philadelphia Ledger records the invention, by Mr. T. B. Rapp, of that city, of glass coffins. They are made air-tight, and of sufficient strength to prevent bulging. The durability of glass is well known, and the remains of the departed being entirely protected, decomposition goes on very slowly.

A FALLING COMET.—A writer in the Boston Traveller, giving an account of Encke's comet, which has recently made its re-appearance, says that it has the striking peculiarity that its orbit and periodic times are gradually decreasing. This comet, it is said, "is certainly falling towards the central luminary;" not theoretically falling as the earth and other planets are supposed to fall towards the sun, as their orbits bend around the centre of revolution, but actually falling, actually drawing nearer at every revolution. Sir John Herschel believes "that it will ultimately fall into the sun," provided it is not "dissipated" before that time.

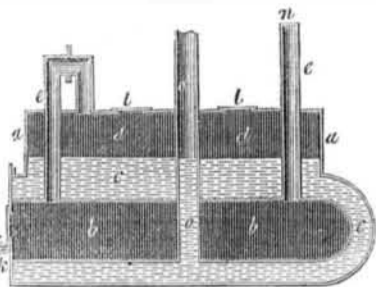
TOO COLD FOR THE FISH.—"We learn," says the New Bedford Mercury, "from Capt. Stubbs, the vigilant keeper of the light-house on Cuttyhunk, that during the severe cold weather of the last few weeks, shoals of Tautog or black-fish were actually driven out of their haunts around the rocky ledges of that island, and came ashore in large numbers. At Nominsha Bight, Gay Head, they were gathered up along the beach in cart-loads, and sent to the New York markets. Such an occurrence has not been known since the winter of 1816, when Buzzard's Bay was entirely closed over, and persons passed and repassed on the ice, during several days, the whole distance between Elizabeth Islands and the main land.

HOOSIC MOUNTAIN TUNNEL.—One of the most practical and scientific railroad engineers in this country, says the Boston Courier, has recently returned from a tour of Europe, having visited all the principal railroad tunnels in England, Germany and France, and has in his possession many interesting facts and statistics in regard to them. The longest tunnel is that of the North, nearly four miles in length, excavated through solid rock by hand drills, at a cost of about three million dollars. The gentleman alluded to expressed a decided opi-

nion that the project of tunnelling the Hoosic elevation is not only feasible and expedient, but imperatively demanded, to concentrate a fair portion of Western business to the State of Massachusetts, by the shortest, cheapest, and levellest railroad route from west to east. Three new steam drills, recently manufactured in Boston, will shortly begin to eat their way into the hidden recesses of the Hoosic mountain.

On Boilers.—No. 13.

FIG. 22.



A great number of steam boilers have been invented and brought before the public at various times since the steam engine received its great improvement from Watt. Steam boilers are important as a subject, more so than many suppose. Some seem to think there is power in a steam engine, but there is none; the power which moves it is the steam, and the boiler is the magazine of force. Skillful engineers are just as careful of their boilers as of their engines. A defective boiler is worse than a defective engine.

The accompanying engravings represent a boiler patented by Messrs. Horton & Fisher, of Birmingham, England, in 1823; its peculiarity seems to consist in the placing of a reservoir for the generated steam within the boiler.

Figure 1 represents a longitudinal section of the boiler, and figure 2 a transverse vertical section. The same letters refer to like parts; *a a* shows the external form of the boiler, around which the furnace and flues are constructed; *b b* is the internal vessel for containing the generated steam; *d d* is that part of the boiler filled with water and replenished by the tube, *o o*, from another reservoir placed above. The heat having caused the steam to

FIG. 23.



fill the upper part of the boiler, *d d*, it passes from thence to the bent tube, *e e*, into the steam reservoir, *b b*, below, from whence it is conveyed to the engine through the tube, *e*. At the upper part of this tube, at *n*, a safety valve is placed for regulating the force of the steam. At *f* is a cock for drawing off whatever water may be formed in the steam reservoir, and under this, at *k*, is an aperture for cleaning out the boiler; *l l* are man-holes.

CONE TUBULAR BOILER.—In 1824 Mr. Joseph Buchanan, of the United States of America, and John T. Paul, a native of Geneva, Switzerland, invented a boiler alike in every respect at about the same time, and the one knew nothing of the other's invention at the time. The boiler consisted of a long tube of small diameter, coiled into a conical form around the inside of the furnace, within which the fuel was placed. The interior of the furnace was a casing of sheet iron, and it had flanges to support the pipe. The fuel was supplied through the upper part of the cone. This boiler was proposed for locomotives and other boilers.

The inventor of tubular boilers was Col. John Stevens, of Hoboken, N. J., the father of R. L. Stevens, Esq., whose name, as connected with improvements in steam navigation is world-wide. This tubular boiler was invented in 1805, used on a small steamboat by Mr. Stevens, and patented in England in the same year. It was the foundation boiler of those

tubular boilers which have done so much for steam navigation and locomotives.

In 1824 a Mr. John More, of Bristol, England, obtained a patent for a boiler, consisting of a series of tubes set up vertically, and arranged in a circle with their upper ends entering a circular chamber and then bent round in a ring horizontally; the lower ends of the pipes entered a similar chamber ring at the bottom. Upon a level with the lower ring, and within the circle of the vertical tubes, the grate was fixed for the fire. The water was supplied through the tubes to the lower chamber, and the upper chamber answered the purpose of a steam box.

In the same year (1824) Samuel Hall, of Basford, England, obtained a patent for an apparatus to generate and apply steam and carbonic acid gas to work an engine. Steam was passed from cylindrical boilers through red-hot coals, and the vapor thus generated was received into a strong vessel—gas box—from whence it was taken into the cylinder of the engine, as steam is taken. In the same year a letter appeared in the Register of Arts, stating that a Mr. Billingham had constructed a furnace, in which coal was burned as usual, but at the back part of it there were a series of retorts set in an oven containing ignited coke, on which was thrown, by jets, a uniform quantity of tar. The smoke from the coal passed through the retorts when it was inflamed. The chamber which contained the retorts—red-hot—was surrounded with the water of the boiler. Fluted cast-iron bars were used in this gentleman's furnace—this has been claimed as a recent invention. He also cased his boiler with boards, allowing a space of five inches, which he packed with charcoal dust to prevent the radiation of the heat. It was asserted that these improvements would enable a steamship to go to any part of the world, as one-half of the fuel commonly used would be saved. Boards were placed inside of the boiler to float on the surface, to prevent priming.

The Aztec Children.

The following is the opinion of Horace Greely in respect to the Aztec children:—

The theory of Agassiz, which assigns diversity of origin or creation as the cause of differences of aspect and color among men, receives no confirmation, in our view, from a scrutiny of the lively, bright-eyed miniatures of Humanity from Central America now exhibiting in our city as "Aztecs." These are far more unlike the Caucasian race than the Hottentot is, notwithstanding their straight hair, light olive complexions, and pleasing features. If our belief in the Biblical account of the original creation of a first pair from whom all the diverse races of men have descended, had needed strengthening, the contemplation of these children would have confirmed it. They are wonderfully like and unlike the men and women who live and move around us, and with whom authentic history deals. Their intellectual faculties are rather limited than deficient; their most obvious defect being that of speech, though they are able to make themselves understood, as well as to comprehend what is said to them. Their spirits are usually buoyant; their apprehension is quick and natural; and the fact stated by the editor of the New York Observer that the girl remembered and resented, on his return after an absence of twenty-five days, his proposal to carry off her playmate and leave her alone, would of itself dispose of the suggestion that they are idiots. Yet with all their vivacity and archness, they fall very far short of possessing an average intellectual development; and we doubt whether the most acute theologian would be able to imbue them with a competent notion of the "Five Points" of Calvinism, the XXXIX Articles of Episcopacy, or any other creed which attempts to embody, in appreciable and credible propositions, the great fundamentals of Divine Truth as affecting Human Duty and Destiny. What ought to be done for them in view of this fact is a question for Doctors of Divinity. And whether they have a sufficiently vivid perception of Right and Wrong—or rather, of the weighty reasons for cleaving to the former and shunning the latter—to justify the "stringing up" of whichever of them might, in a sudden fit of passionate resentment, take the life of the

other, let experts in Medical and Phrenologic Psychology determine; we would rather be excused from the task.

Devotees of Science and of Letters—Students of Nature and Man, will find (and presume do find) in an hour's contemplation of these "Manikins," food for many hours of profitable reverie and contemplation. The trains of thought they suggest lead across oceans of Speculation to continents of vanished History. That these gnomes are not freaks of nature, as Tom Thumb is, we are confident; that their diminutive stature, mental and physical, is the result of some inveterate disregard of Nature's requirements, we cannot doubt.

The remote ancestors of these pocket editions of humanity, were doubtless native Americans of a peculiar stripe—they abhorred the idea of intermarriage with foreigners and guarded the purity of their race by cousinly intermarriages, until at length there were none but cousins or nearer relatives to marry;—all others having disappeared through the dwindling of the population, both in size and in number. The consummation (very nearly) of this policy is before us.

But while few would consent to be Aztecs, care-free and playful as their life would seem to be, there is no reason why any should refuse to see them. They are specimens of a Race which has probably no other surviving members—at least very few others—and it is not probable that any others will ever be seen here. The wise and the simple, the learned and the ignorant, hoary Age and curious Childhood, may derive both interest and instruction from an hour spent in their society, and we learn with pleasure that the number of their visitors is steadily increasing.

Colt's Pistols.

Five hundred of Colt's Revolving Pistols have been sent out to the officers of the British army, now engaged in the Caffre war. Thus, it is, Jonathan is teaching his dady how to make shooting irons, after having taught him how to use them. It is quite natural that the son, if he is a good boy, should know a little more than his father.

Steamboat Building.

At Pittsburg, during the year 1851, fifty-two steamboats were built, being one per week for the whole year. The number of keel flats and barges were forty-eight. During the same period thirty-four steamboats were constructed at Louisville, Ky.

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