SCIENTIFIC MUSEUM.

Deepening the Rivers Clyde and Hudson.

All the steamships of the Cunard Line were built on the River Clyde, in Scotland, and received their engines at the City of Glasgow, at the extremity of navigation on that river. The Atlantic screw steamships, which run from Philadelphia to Liverpool, and the "Glasgow," which runs between New York and Glasgow, were built and received their engines at the same place. The river is a very insignificant one at Glasgow, so far as it respects the quantity of water discharged into it, and is no more to be compared with the Hudson, than is the Mohawk. It is not insignificant, however, in the lesson which it might teach the people of Albany, regarding the deepening of the Hudson, to promote its navigation for vessels of heavy tonnage. As promised by us in the Scientific American of last week, we will proceed to present an outline of what has been done on this river, which will be found, to sustain the views of Mr. Battell, with respect to improving the navigation of the Hudson. In 1750 there were only three feet of water in the channel of the river Clyde; in 1850 there were 17½ feet of water. In 1758 an act of Parliament was obtained to make a lock to secure 4½ feet of water up to Glasgow, but it never was made, for a plan of systematic improvement was laid out by the celebrated James Watt, which was soon acted upon, and from that day to this the improvement in the channel of the river has steadily progressed. There were at that time a number of fords or sand banks in the river, and at Glasgow there was one, on which there were but 15 inches water, and about 3 feet spring tides. The lowest ford was at Dumbuck, 12 miles below Glasgow. It was deepened in the autumn of 1770 from 2 feet at low water to a depth of six feet, at an expense of £2,300 ($11,300). The great object of this deep cut was to allow a larger body of tidal water up the river—the next step being by a jetty of stones run out from the shore to secure the ebbing of the waters through the new cut. The largest vessels now sail where once was this ford, which formed the outermost link of the old Roman Empire.

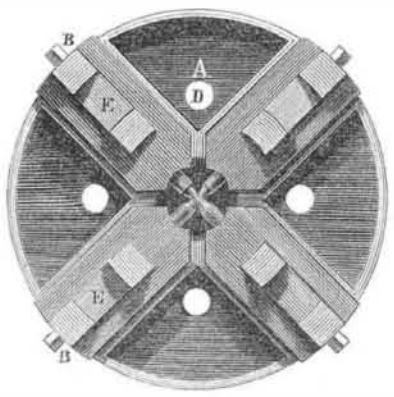
"The improvements were commenced by deepening at the fords and running jetties of loose stones out from the shore to low-water mark; these guided the water into the channel, which was thereby deepened. Continuous dykes, parallel with the current, were then formed, by which a uniform depth was maintained; and in 1807 a tracking path was formed along the south dyke from Renfrew up to Glasgow, 24½ miles of these were dykes formed, and cost from 25s. to 30s. per lineal yard of dyke. In 1824 the tides and freshets had scoured away about two million cubic yards, and gained a depth of 13 feet. In 1824 the steam dredging machine was introduced, being its first application to a river in Scotland, and since then about three million cubic yards of stuff have been lifted, besides many tons of stones by means of diving bells. In 1842–5 channels were cut through Port-Glasgow and other banks, and 420,000 cubic yards removed.

The water above Glasgow has, in suspension about 22,000 cubic yards of fine stuff annually. In the harbor alone about 80,000 cubic yards of silt accumulate annually, and about 90,000 in the river, including an annual accumulation at Bowling of 60,000 cubic yards, which costs the trustees about £1200 per annum to remove. The whole cost of maintaining the depth is upwards of £8000 a-year; the average price being, lifting, 8d; depositing, 4d—equal to 1s. per cubic yard."

The foregoing extracts marked as quoted, are from a paper on the subject by W. Campbell, C. E. The facts prominently set forth are, that by removing the fords or sand banks, and dyking or walling up, as proposed by Mr. Battel, a river which at one time, only admitted sloops and coal boats of about 100 and 200 tons, now allows ships of 2000 tons burden to sail up twelve miles above the place (Dumbuck) where there were only 2 feet of water 100 years ago. The price of dredging and keeping the river clear, is given in Sterling currency, which is still taught (whether it be wise or not) in our schools, and will be understood, but we could not afford to do the same work here at the same price. But even allowing the people of Albany to put up the figures one half more, they would find them all against the building of a new and expensive ship canal. Let them get powerful dredging boats and build walls to narrow the channel, and then not fear, but a most wonderful change for the better will be effected in the Hudson River.

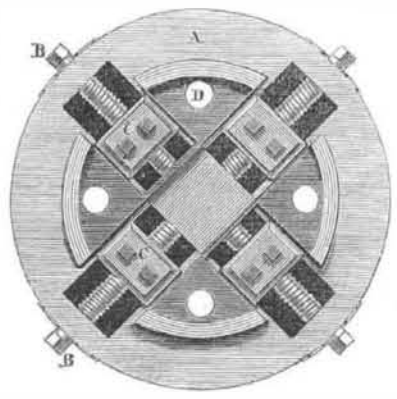
Hogle's Patent Universal Chuck.

Fig. 1



The annexed engravings are a face view (fig. 1), and a back view (fig. 2) of the improved chuck, invented by S. S. Hogle, and for which a patent was granted in November, 1841, but which has not been introduced into this region, and which is but very little known generally—not so much as it should be. E E are the jaws, they are worked by the screws, B B. C C are the nuts on the back side. Every opposite jaw is secured on the same screw, and is worked by a simultaneous motion, except that the opposing screws on the same spindle are right and left. A is the circle plate of the chuck, and D are bolt openings in the back plate. The shanks of screws, B B, are tapered at the centre of the chuck, so that one works and rolls on the other, which allows them to cross in a very small space. It is calculated to chuck articles of a very large size and articles of only three-fourths of an inch in diameter. It is strong and simple, and any chips that may gather in the middle, will fall out on the back side under the screws. It is adapted for centric and eccentric chucking. The engravings will at once show the machinist the difference between this and other chucks, and how each opposing pair of jaws can approach near to and recede from the centre as may be desired. Instead of having a screw for each jaw or sliding gripe piece, as in the old universal chuck, this one has two screw shafts, crossing one another at right angles, with a right and left-

Fig. 2.



handed screw on each, so that by the turning of each screw shaft, two jaws are made to approach or recede from one another in their radial grooves. To increase the capacity of the chuck separate jaws are put on the chuck, the one fitting into the mortise of the other, and secured by screws.

The assignee of the patent for this chuck, in this state, is Thomas Ashley, of Waterloo, Seneca Co., N. Y., who manufactures the article, and from whom more information may be obtained by letter.

Experiments have been lately made at Berlin with cannon having rifle bores, and loaded at the breech with a conical missile, which is hollow, and contains powder. These experiments are said to be very successful. With 1½ pounds of powder a missile was thrown more than 6,000 feet.

Carbonic Acid Gas.

Carbon exists in a variety of forms—charcoal, anthracite lamp-black, diamond, are all different forms or states of the same element. There is but a small amount of carbon in the mineral world—none, indeed, but what is supposed to have been of organic origin. But in the organized world it is a fundamental and universal element. When wood or coal burns or decays, or when living things perish, their carbon combines with oxygen, and the substance formed is known as carbonic acid. This is a universal product of combustion, whether in the ungovernable conflagration or the measured respiration of the living animal. Carbonic acid is a heavy gas—it extinguishes fire and destroys all animal life. If an animal attempts to breathe it pure, there is spasmodic closure of the glottis and the animal dies as speedily as if strangled with a cord. It breathed when diluted with 90 per cent. of air, it acts as a narcotic poison, inducing, sleep, torpor, and death. Carbonic acid gas and steam are employed in the Fire Annihilator to extinguish flame. There is a small portion of carbonic acid gas in the atmosphere, namely, one gallon diffused through 2,000 gallons of air. This may be increased ten-fold or to one half per cent—more than this is injurious. A man exhales about 20 cubic feet of carbonic acid per day, which would therefore vitiate or spoil 4,000 cubic feet of air each day, or equal to all that is to be found over a space of 56 square feet to the top of the atmosphere annually. Larger quantities still are generated by combustion and decay. Water has a strong attraction for carbonic acid and absorbs much of it. It then acquires new properties, particularly the power of dissolving a great number of minerals.

A Rival to Tea.

The "Singapore Free Press" recommends the use of the coffee leaf as a substitute for the berry. The writer appears to be an English planter of the Dutch settlement of Padang, in Sumatra, where the coffee plant has been cultivated for several generations, and where it is now produced in larger quantity, and of better quality than in any country of the Malayan Islands, Java excepted. The coffee plant is an evergreen large shrub, which yields a profusion of leaves, and bears fruit for about twenty years. The leaf, and even the twigs, have, in a minor degree, the same stimulating and exhilarating property as the berry, and its habitual use by the natives of the country, agricultural Malays of very simple habits, and little amenable to innovation, shows that they at least find the coffee leaf to make a wholesome and agreeable beverage. The introduction of this article into our consumption would, we cannot help thinking, be a benefit to the poor, and to our colonial planters.

In order to render coffee leaves marketable for European consumption, the best mode of preparation will consist in subjecting them to the same kind of manipulation as tea undergoes; and for this purpose it would probably be expedient, at first, to employ, for instruction, Chinese skilled in the art, such men as Mr. Fortune lately brought from the northern provinces of China to Upper India. The leaves of coffee, neither fleshy nor succulent, are even more easily dried than those of tea, and being larger and more abundant, while the plant itself is more easily reared than tea and embraces a much wider geographical range, it is certain they might be sold at a lower price than the poorest Bohea. It may be added that the leaves so prepared would not be amenable to the charge of adulterations so often urged against the ground berry.

The Burning Coal Mountain.

That portion of the Broad Mountain, called the "Fiery Mountains," from the fact of the anthracite coal at that point being on fire—which has been burning for the last fifteen years, is situated about five miles from Minersville and fifteen from Schuylkill Haven. It is now considered a very dangerous experiment to travel over the mountain, as it is supposed that in many places the surface is a mere superficial crust or shell, the coal having been consumed up to the surface, and hence the least pressure thereon, it is presumed, might break through and let the adventurer down into the fiery chasm below. At the base of the mountain, in one place, a stream of water almost boiling hot, comes out. The surface of the mountain presents a desolate appearance as far as the eye can reach. The mountain is either cracked, burned or broken into enormous and fearful depths by the approach of the fires to the upper stratum; roots and trunks of the lofty trees are charred and blackened, mingling their pyroligneous odor with the sulphurous vapors from the hot caves and crevices around. The calcined bones of birds, reptiles, and small quadrupeds, lie here and there, half mixed with the mineral ashes, to fill up the blasted view, while amidst the vast scene of desolation may be seen a solitary wood-flower, springing from this perpetual "hot-bed," and presenting, in the uncongenial atmosphere, a mockery of bloom.

Astor Library.

The funds and property of the institution are valued at $450,000. The cost of the building and site $70,000, and the expenditure for books thus far $75,364. More than 60,000 volumes have been collected, and Dr. Cogswell is now in Europe, authorized to expend $25,000 in the purchase of additional works. Commencing with about eighty thousand volumes, free from debt, and having a vested fund of $180,000, the interest of which is to be steadily applied to enlarging the collection, this must ultimately become one of the largest libraries in the world.

Butter.

Forty thousand pounds of butter, recently imported into Boston from Ireland, were taken back in the Europa, which sailed on the 2nd ult., not having commanded a sufficient price.

LITERARY NOTICES.

The Cold Grapery—By W. Chorlton; 12mo, pp. 93; published by J. C. Riker, 129 Fulton street, N. Y. This is a useful little manual for the vine grower, in which the use of glass houses, but without heat, is ably advocated by the author a practical gardener who gives directions as to the course to be pursued with diagrams of the different roofs that are and ought to be employed. Works like this, that are written by really practical men, are far more to be trusted than the pseudo guides of pretended agriculturists who more often mislead the enquirer than direct him in the right path. Really practical works, written by plain practical men, are of the highest value, but the trashy works of scientific quacks in every branch of knowledge, are worse than useless. This work is to be placed in the former category, and is cheap at any price for real knowledge is worth its weight in gold.

"Graham's American Magazine," for April, is enlarged to 144 pages, and is one of the very best literary publications in the country. The articles, original and selected, are from the first authors. Dewitt & Davenport, agents, Tribune Buildings, New York.