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SCIENCE, ART AND DISCOVERY.

68-3

GAS-MAKING.—The process of making coal gas is simple. Bituminous coal is thrown into a hot cylinder of iron the mouth of which is closed carefully by an iron door, with the edges cemented by soft clay. The vapor arising from the coal is received into a tube, by means of which it is permitted to escape into a series of vessels, where it is cooled and deposits much of its impure matter. It is then passed into another series of vessels containing quicklime, which robs it of its sulphurous and other nauseous intermixtures. From this receiver it flows purified, as we find it in use, into the gasometer, and is from thence distributed, as it may be needed, through mains and service-pipes, into various parts of the city. The highly charged bituminous coals, such as the English Cannel coal or the Albert coal of Nova Scotia, are found best adapted to the purposes of gas-making. In the manufacture of gas from Newcastle coal, a chaldron weighing 27 cwt. is found to yield 8650 cubic feet of gas, 14 cwt. of coke, 12½ gallons ammoniacal liquor, 12 gallons of thick tar.

Cannel coal will yield upon an average 12,000 cubic feet of gas to the chaldron. Gas coal in New York costs upon an average $12 per chaldron.

It has been questioned whether the competition found so needful in most other departments of industry is of service, or even allowable, in the manufacture of gas. We have no experience in the United States as to the effect of such competition. That of England, however, is, that wherever two companies occupy the same district, they not only prove injurious to each other, but in the end are disadvantageous to the public. Two capitals are invested, two sources of wear and tear are created, two sets of officers require to be maintained, and finally, upon their union, which sooner or later must follow, the public are required to pay the additional expense incurred by the rival works.

FACTS ABOUT MILK.—Cream cannot rise through a great depth of milk. If, therefore, milk is desired to retain its cream for a time, it should be put into a deep, narrow dish; and if it be desired to free it most completely of cream, it should be poured into a broad, flat dish, not much exceeding one inch in depth. The evolution of cream is facilitated by a rise, and retarded by a depression of temperature. At the usual temperature of the dairy—50 degrees of Fahrenheit—all the cream will probably rise in thirty-six hours; but at 70 degrees it will perhaps, rise in half that time; and when the milk is kept near the freezing point, the cream will rise very slowly, because it becomes solidified. In wet and cold weather the milk is less rich than in dry and warm, and on this account more cheese is obtained in cold than in warm, though not in thundery weather. The season has its effects. The milk in spring is supposed to be the best for drinking; hence it would be the best for calves; in summer it is best suited for cheese; and in autumn the butter keeping is better than that of summer—the cows less frequently milked, give richer milk, and consequently more butter. The morning's milk is richer than the evening's. The last drawn milk of each milking, at all times and seasons, is richer than the first drawn, which is the poorest.—*Western Agriculturist.*

ART OF MULTIPLYING AUTOGRAPHS.—At the last session of the Academy of Sciences in Paris, M. Seguier made a report that M. Lachard has invented a process, simple, certain and rapid, by which he can re-produce writing, transfer it to stone, and consequently multiply autographs to any extent. M. Lachard having been invited to repeat his experiments before a committee of the Academy, asked M. Seguier and colleagues for a few lines written and signed by themselves. The piece of paper before the ink was yet dry was applied to blotting paper, and this blotting paper M. Lachard took home with him. The next day M. Seguier received two copies, one on parchment and the other on ordinary paper, of the original, which he had kept in his own possession, and which the copies so exactly resembled that it was impossible to tell which of the papers was written first. This would be a dangerous discovery in the hands of a counterfeiter.

CORRUGATED IRON.—Experiments have been made at Washington, to ascertain the strength added to iron by corrugation. A plate three inches long and four broad, so thin that, supported at the ends, it would bend of its own weight, when corrugated sustained a weight of 600 pounds. Corrugated iron has been adopted for many camp utensils. A camp bedstead of this iron weighs fifty pounds, and is equally strong with the English camp bedstead weighing 150 pounds. A corrugated iron water-tight wagon-body, that floats from 2000 to 2500 pounds of freight, besides the running gear, and weighs less than a wooden wagon-body to carry the same freight, has also been adopted into the service of the United States, besides other articles of the same material. The additional strength of the iron in this form is obviously upon the principle of the arch. A circular tube is, in proportion to its amount of material, the strongest of all forms.

WATERMELON MOLASSES.—An article has been going the rounds of the papers about the practicability of making molasses from watermelons. We felt incredulous on the subject, but have recently been presented with a bottle of it by our friend Philip A. Mason, of Woodbury, N. J., who is well known in this market as a successful grower of the mountain sweet watermelon. It is really a nice article, clear, sweet, and of a very pleasant flavor. He informed us the only process was to boil down the pulp to about one-half. The boiling was continued for several hours. Whether it will pay to manufacture molasses in this way, is another question, and a matter of very great doubt. —*Pennsylvania Farmer.*

A BERTH for steamships and sailing vessels has been invented, with a view to prevent, by its use, sea-sickness. At the bottom of the berth are two wide convex pieces, or battens, from the centre of the under side of which converge heavy steel balance springs, which are hooked to the sides of the berth. These springs are made to possess considerable elasticity, so that the occupant of the berth will always preserve his balance, no matter how much the vessel may be tossed.

The Weather Since 1790.

The following table gives an account of the weather in Philadelphia, from January 1st, 1790 to January 1st, 1847. Medium or average for each day is given, and the authority is Mr. Charles Pierce:— 68-2

Medium Temperature. JANUARY.		*Medium Temperature.* FEBRUARY.		*Medium Temperature.* DECEMBER.	
1790—44	deg.	1790—32	deg.	1790—30	deg.
1791—30	"	1791—28	"	1791—32	"
1792—32	"	1792—30	"	1792—30	"
1793—40	"	1793—32	"	1793—30	"
1794—32	"	1794—31	"	1794—31	"
1795—30	"	1795—30	"	1795—30	"
1796—30	"	1796—28	"	1796—32	"
1797—28	"	1797—26	"	1797—30	"
1798—28	"	1798—26	"	1798—28	"
1799—30	"	1799—29	"	1799—29	"
1800—28	"	1800—27	"	1800—30	"
1801—34	"	1801—28	"	1801—34	"
1802—38	"	1802—34	"	1802—28	"
1803—32	"	1803—28	"	1803—30	"
1804—28	"	1804—28	"	1804—34	"
1805—29	"	1805—29	"	1805—30	"
1806—30	"	1806—28	"	1806—32	"
1807—28	"	1807—28	"	1807—32	"
1808—27	"	1808—32	"	1808—30	"
1809—29	"	1809—26	"	1809—29	"
1810—36	"	1810—27	"	1810—28	"
1811—32	"	1811—26	"	1811—30	"
1812—28	"	1812—27	"	1812—28	"
1813—29	"	1813—27	"	1813—28	"
1814—28	"	1814—28	"	1814—30	"
1815—26	"	1815—24	"	1815—26	"
1816—32	"	1816—28	"	1816—32	"
1817—34	"	1817—26	"	1817—31	"
1818—34	"	1818—26	"	1818—34	"
1819—30	"	1819—28	"	1819—26	"
1820—26	"	1820—30	"	1820—28	"
1821—25	"	1821—32	"	1821—26	"
1822—29	"	1822—27	"	1822—30	"
1823—34	"	1823—36	"	1823—36	"
1824—32	"	1824—34	"	1824—34	"
1825—34	"	1825—32	"	1825—34	"
1826—28	"	1826—26	"	1826—37	"
1827—28	"	1827—27	"	1827—36	"
1828—39	"	1828—40	"	1828—38	"
1829—29	"	1829—27	"	1829—34	"
1830—28	"	1830—25	"	1830—32½	"
1831—26	"	1831—26	"	1831—30	"
1832—25	"	1832—27	"	1832—25	"
1833—30	"	1833—30	"	1833—32	"
1834—29	"	1834—29	"	1834—33	"
1835—28	"	1835—28	"	1835—28	"
1836—28	"	1836—24	"	1836—33	"
1837—28	"	1837—33	"	1837—32	"
1838—38	"	1838—24	"	1838—29	"
1839—30	"	1839—33	"	1839—34	"
1840—24	"	1840—39	"	1840—30	"
1841—33	"	1841—29	"	1841—35	"
1842—34½	"	1842—38	"	1842—32	"
1843—38	"	1843—27	"	1843—34½	"
1844—27	"	1844—32	"	1844—35	"
1845—38	"	1845—35	"	1845—28½	"
1846—33½	"	1846—28	"	1846—35	"

The Temperature of each year from 1790 *to* 1847, *making* 57 *years.*

Temperature of			Temperature of			Temperature of		
1790	was	52	1809	was	51	1828	was	54
1791	"	52¼	1810	"	51	1829	"	53
1792	"	52	1811	"	52	1830	"	52½
1793	"	53	1812	"	51	1831	"	53
1794	"	50	1813	"	50½	1832	"	51
1795	"	51	1814	"	51	1833	"	52½
1796	"	51½	1815	"	51¼	1834	"	52¼
1897	"	51	1816	"	49	1835	"	52
1798	"	51	1817	"	52½	1836	"	50¼
1799	"	51	1818	"	53	1837	"	52¼
1800	"	51½	1819	"	51	1838	"	53
1801	"	52	1820	"	51¾	1839	"	52
1802	"	53½	1821	"	51½	1840	"	52¼
1803	"	52	1822	"	53	1841	"	51½
1804	"	51	1823	"	53½	1842	"	52¾
1805	"	51½	1824	"	53¾	1843	"	51½
1806	"	51½	1825	"	54	1844	"	53
1807	"	52	1826	"	53	1845	"	54
1808	"	52	1827	"	50	1846	"	54

As any one but an ignoramus might have anticipated, the laws of nature were too strong for the enemy. The first engagement took place between them in June last, immediately after the Cornish engine had been placed in position by the scientific gentlemen whose opinions were to govern the Common Council of Hartford. Some prudence was manifested in commencing the assault, and attempts were made to conciliate the water by gentle treatment. At first the engine was started at three strokes a minute—just to get the water used to it. To every stroke of the enemy, the water of course gave a hearty thump in return, just by way of reminding him that the joke had gone far enough. However, it would not do to submit without a struggle, and it was resolutely determined to raise the speed to *three and a half* strokes a minute. At this attempt of the enemy to violate the laws of its being, the water took its revenge, and a wreck followed in no time. The cast iron bonnet capable of enduring a pressure of at least two hundred pounds to the inch, was shattered, saving the rest of the concern from destruction; and the water was left master of the field. The enemy hauled off to repair damages, and it will be many a day before the attack is renewed. I have just come from the scene of the contest. The Cornish engine is laid up in white lead and tallow, and has not had steam since June. The fight lasted only about five days; but that settled stupidity for a while, at least. 68-1

I am informed however that another campaign is to be begun. Reinforcements are needed; and an appeal has been made to the city of Phila. to appropriate five thousand and five hundred dollars to enable the enemy to carry on the war with renewed vigor. One branch of the city council has appropriated this supply, but the other hesitated. Some of its number feel a sympathy with the water and do not think it ought to be treated so; and others fear that a contest of this kind is too expensive even for a great city. The amount called for is to build a stand-pipe, but it is not sufficient—and when the stand-pipe is built it is not certain that the enemy will prevail yet. Cast iron and stupidity can do much no doubt, when backed by money enough; but in a fight where *gravity, inertia, and momentum* are all combined against them, they will find as formidable an opponent as Russia is to the Allies. The best thing that Philadelphia can do is to follow the example of Hartford, and to retire from a conflict in which nothing can be expected but broken bones—submitting to the first rather than a greater subsequent loss.

It may be satisfactory to the gentlemen who examined and reported upon the old engine at Philadelphia to know that they still are preforming good service in the same building in which the Cornish engine fought its last battle and came off without any laurels; and that their condition is much improved by the care of better engineers than formerly—giving every indication of a long and useful career.

It will be readily perceived, that if the Cornish engine cannot run three and a half strokes a minute at Philadelphia, where the pipe is not much more than half the length of the Hartford one, it would not be able to run two strokes a minute at Hartford. It was calculated to run ten strokes in order to give the supply needed, and I suppose that all will agree, that the theory upon which the Council acted was correct, and that it would have been impossible for the machine to have done it.

Persuasion is better than force in the physical, as well as the moral world; and if water cannot be induced to flow up hill with *a uniform and constant flow, produced by the application of a uniform and constant power*, it is of little use to attempt to *kick* it up, by rushing at it ten times a minute with a great clumsy plunger loaded with cast iron, and stupidity.

It will, no doubt, be satisfactory to those gentlemen who voted with me, to know, that whatever may happen from their act, it cannot be a more complete failure than would have happened had they not taken the responsibiity of deciding as they did; as it is gratifying to me to know that in leading them to take this responsibility, I made no argument or statement which experience has found to be fallacious.

The Cornish engines at Jersey City and Buffalo, have fallen far short of their promise, and are practically, failures. But of that, more hereafter.

Yours, very truly, EDW. N. DICKERSON.