

THE ROMANCE OF MODERN SCIENCE.

The old alchemists wasted their lives in the pursuit of two unattainable objects—the philosopher's stone and the elixir of life; the former to turn all metals into gold, and the latter to bestow perpetual youth. It is now known that the turning of all metals into gold would have greatly diminished, instead of adding to the wealth of mankind; for if gold were made so abundant, it would no longer answer the purpose of money, and for use in the arts it is less valuable than iron. It may be that men will sometime be brought to the belief that fading youth would be no blessing, but with our light, it would be received as the greatest boon which it is possible to imagine.

Modern science does not expend its efforts in the pursuit of these chimeras; but while it is familiar with marvels of which the ancient alchemists could form no conception, its own future is not wholly unadorned with the dreams of romance. Had some superior intelligence appeared to one of the long-bearded old Arabs, among his retorts and crucibles, and prophesied the achievements which the human race were destined to make within a few hundred years, how utterly incredible would have been the prophecy!

Looking down the future he would have said, "It shall be ascertained that Arabia, the Red Sea, and all the countries that you ever heard of are not at rest, but are constantly rushing away towards the east more swiftly than the flight of an arrow from a bow. The distance from us to the sun is such that a horse, running 20 miles an hour, without rest day or night, would require more than 500 years to make the journey, and yet this distance shall be measured with a rod and line. Though this fiery orb is as large as 1,400,000 globes the size of this earth, man shall measure its mighty span. He shall weigh its vast mass with a balance, and the sum of its tuns shall be told. Hidden from the eyes of all who have ever lived, deep sunk in the depths of space, he shall behold countless myriads of other suns, and shall approximately compute the inconceivable distances which separate them from us. Swarming in the dust beneath our feet, in the air we breathe, in the interior of our own bodies, in every stagnant pool, he shall discover multitudes of living beings, of strange and curious structure, whose numbers cast those of the visible inhabitants of the earth into insignificance. He shall put iron into a condition in which it shall become as incorruptible as gold, and thus shall your long sought philosopher's stone be discovered. The impalpable vapor which rises from water he shall harness to his chariot wheels; he shall make it dig his mines, grind his corn, saw his wood, weave his clothes, and drive his ponderous iron ships over the stormy sea to great continents now undiscovered. At his easy command, the rock shall leap from its firm bed and rush headlong through the air. He shall lay his hand upon the solid mountains and they shall yawn open to his passage; he shall be borne through them in ease and comfort with a velocity unattainable by the fleetest steed. The sunbeam shall become his most faithful limner, and the thunderbolt of heaven the obedient servant of his will; in silence it shall glide swiftly forth, bearing his messages of business, of pleasure, or of caprice, to the uttermost parts of the earth in the twinkling of an eye."

The modern student of science, to whom these incredible marvels are accomplished and familiar facts, seems less hopeful of the continued triumphs of human intelligence than were the ancient alchemists; but there are some ardent imaginations that love to sweep forward and revel in dreams of the future power of our race; though the wildest flights of the most fertile fancy are tame when compared with the accomplished achievements of the past. These minds conceive that man's power of transporting his body from one place to another has by no means reached its ultimate limit; that he will not only move more swiftly over the earth, but that he will sail through the air and sweep under the sea. In their view, as the coal fields fail, man will bore through the solid crust of the earth and warm great cities with its internal fires. The appliances of industry will continue to be multiplied till all are able to command leisure, and thus to secure mental cultivation. With the removal of ignorance and the temptations of poverty, degradation, vice and crime shall cease, and oppression and war shall be brought to an end; and in-

telligence, comfort, prosperity, virtue, peace and happiness shall be the common inheritance of all. Higher still! As the decay of old age is caused by the gradual accumulation of solid deposits in the system, and as there are known solvents of these deposits, some of the boldest imaginations behold the future filled with the brightest of all hopes—the promise of perpetual youth.

WATER GAS FACTS.

TO THE PUBLIC.—In maintaining a controversy concerning the merits of Sanders' "Water Gas," we have been controlled by commercial and economical considerations, rather than by a desire to propound scientific theories, or to debate conflicting claims of patents. We believe that we possess a process, the general adoption of which would improve the quality of the illuminating gas in common use, while reducing its cost to consumers.

We have always invited critical inspection of the practical operation of the "Water Gas," and have made repeated demonstrations of each and every stage of the process of manufacture. A disappointed reporter to the SCIENTIFIC AMERICAN, however, who had aroused the suspicions of our company and of the employes at the Girard House, supplied that journal with a long statement of matters and things he neither saw nor heard, together with his conclusions from such premises. Facts being stronger than words, however abusive the latter may be, we submit the following statement of a single day's operations of the present week at the Girard House, as a sufficient refutation of Mr. Seely's slippery narrative and false conclusion.

GIRARD HOUSE, PHILADELPHIA, }
November 12, 1860.

TO HENRY C. CAREY, Esq., President of the Keystone Gas Company.

SIR:—As requested by you, I respectfully submit a statement of the consumption of materials and the results thereof of twelve hours' regular running of the gas machinery at this establishment.

Yesterday, November 11th, we began our daily manufacture of "water gas," by Sanders' process, at 12½ o'clock P.M., our station meter registering an aggregate of previous manufacture of 610,700 cubic feet; our charge was exhausted at 12½ o'clock A.M., this date, the meter registering 621,900 cubic feet—thus showing our production of gas within that time to have been 11,200 cubic feet; the average manufacture having been 933 feet per hour.

The consumption of rosin was 497 lbs., equal to 44 4-10ths lbs. per thousand feet of gas. The charcoal consumed was three bushels. The fuel used was nine bushels of coke. The cost of purification did not exceed one cent per thousand feet. At no time was rosin supplied to any retort, except in conjunction with the vapor of water as required by Sanders' patented specifications.

The foregoing comprises all of the materials used, excepting cost of steam, which is inappreciable, being taken from the boilers of the hotel, but which may be calculated to not exceed 1c. per thousand.

Yours, respectfully,

JAMES E. PLACE, C. E.

HENRY C. CAREY, Esq.,

DEAR SIR:—The quality of the gas made and used in the Girard House, during the hours covered by Mr. Place's statement, was fully equal to any previously furnished to us from our private works, and superior in brilliancy to the gas supplied by the city.

Very respectfully, yours,

PRESBURY, SYKES & Co.

Girard House, Philadelphia, Nov. 12, 1860.

The prices of the above materials vary in some degree in different sections of the Union. At those at which they can be here supplied, viz.:—Rosin, \$1 75 per barrel; coke, 5 cents per bushel; charcoal, 11 cents per bushel. The cost of the "water gas," as above made, would be 40 cents per thousand cubic feet, exclusive of labor, which may be estimated from 10 cents down to 3 cents per thousand, decreasing with the increase of quantity manufactured.

We have repeatedly offered to supply the City Works with gas at seventy-five cents per thousand feet, and under arrangements that would give to the City Treasury perfect security against loss, and to consumers an absolute certainty of being supplied with a light far more brilliant than that they now obtain. Why have the Gas Trustees refused to accept the offer?

HENRY C. CAREY,
MARMADUKE MOORE,
A. HART,

Committee of the Keystone Gas Co.

Philadelphia, November 13, 1860.

The above card we find in the advertising columns of most of the Philadelphia daily papers.

The Keystone Company will no doubt be surprised to find their advertisement transferred to these columns without charge, reflecting as it does upon the integrity of the gentleman who was sent to Philadelphia to investigate the merits of the Sanders' water gas. The result of his investigation was published two weeks ago, and notwithstanding the assertions of Mr. Place,

engineer of the works, as to the wonderful results he obtained in twelve hours' operation, we still think the conclusions to which our reporter arrived are quite as likely to be correct as the statements of Mr. Place. It must be remembered that Mr. Place is in the employ of the company to whom he makes his report; that his statement is not accompanied by any affidavit that such a result was obtained, nor is it supported by the evidence of any one not pecuniarily interested in the success of the enterprise. The public have learned to make some allowance for the assertions made in newspaper advertisements, emanating even from the most respectable firms, and, while we are not advised whether there is any water gas stock in the Philadelphia market, the thought suggested itself on reading the above card that possibly the present stockholders had got alarmed at the proposal of having their works put to a practical test by disinterested, capable experts, and before the public demanded it in too strong terms to be resisted, they would try to sell their stock. Before such an examination, they would see what virtue—à la Bonner—there might be in advertising their wares. This was no doubt a wise conclusion, one that would suggest itself to any body of equally shrewd business men; but it is not for us to discuss the motive which dictated the above card; it is simply facts we want and which the public demanded. When these can be so easily obtained, by the company simply permitting a disinterested, competent person to make a few of the most simple tests at their works, which can be done in two hours' time, so as not to incommode their regular operations, we must think that their advertisement above does not detail all the facts.

We close by again reminding the Keystone Gas Company that the public will not be satisfied with the simple assertion of any one of their employes until supported by that simple test we have pointed out, made by some disinterested expert, in the presence of one or more disinterested, respectable gentlemen. We shall be more happy to chronicle the successful result after such a test than to be obliged to confirm the suspicion of the public as to the practicability of the Sanders' water gas.

DEATH OF LORD DUNDONALD.

By recent news from Europe we learn that this nobleman died in London on the 30th ult., at the advanced age of 85 years. He was a very extraordinary man; his numerous daring exploits as a naval commander, and his many inventions in the useful arts won for him a distinguished reputation for heroic courage, skill and inventive genius. His father—Archibald Cochrane, ninth Earl of Dundonald—was a good chemist, and quite an inventor in his day. His name appears on the roll of the early patentees, who succeeded in obtaining burning fluids from the products of coal tar. But he was a far better spender than a maker of money, for he actually wasted a large fortune in scientific pursuits, and his son, the lately deceased earl, declared that "of our once extensive ancestral domain in Scotland, I never inherited a single foot." His father's genius, however, he doubtless did inherit; so that after having chosen the navy as a profession, he soon became the most renowned officer in the British service. Being promoted to the command of a small war sloop of 158 tons, named the *Speedy*, he contrived to carry terror along the whole coast of France, as a most daring and crafty cruiser. With this craft and only 50 men, he attacked a Spanish frigate of 32 guns, and captured her in one hour and a half. He was afterwards promoted to the command of a frigate, with which he was engaged in several actions of the most desperate character, and always with success. In 1807, he became a Member of the British Parliament, and was a bitter opponent of the corrupt tory administration of that day, and for this Lords Castlereagh and Liverpool revenged themselves, in 1814, by a cabal that deprived him of his command in the navy, his seat in Parliament, and doomed him for one year to a prison. After this, he left England, became commander of the Chilean fleet when fighting for independence, in 1817, and subsequently (in 1827) he became Admiral of the Greek fleet, then fighting for liberty against the Turks. Byron immortalized him in his "Don Juan," and his fame resounded throughout the world for deeds of successful and unflinching courage. In 1830, he was rein-

stated with honor in the British navy; the charges upon which he had been dismissed were found to have been false, and he was soon afterwards promoted to be Admiral of the West India fleet. In this service, his attention was directed to the peculiar pitch of the remarkable lake in the island of Trinidad, and his inventive mind soon made it subservient to useful purposes. He secured patents in 1852 for making tubes and manufacturing oil from this substance, and some very excellent lubricating unguents have been made from it in the vicinity of New York. He was also the inventor of a rotary steam engine, which was used for some time in one of the British frigates, and quite a number of improvements relating to ships-of-war. Of all his inventions, however, perhaps the best is his vertical tubular marine boiler, for which he obtained a patent in January, 1843. This boiler has two water chambers, one above the other, connected by a series of water tubes between which the heated products of combustion pass from the furnace. In this boiler, a constant circulation of the water is secured, and so far as we can judge, this is essentially the one which has been lately adopted, and is now held to be the best in the American navy. An illustration of this invention was published on page 200, Vol. II., of the Journal of the Franklin Institute for 1850; and as our motto is, "honor to whom honor is due," we state these facts for the honor of the deceased noble inventor, who is now beyond the reach of flattery or blame, and who, after a thousand hairbreadth escapes from death on sea and land, lived long beyond the common age of man.

WATER GAS—A SENSATION.

The engineer in charge of the water gas works at the Girard House has seen fit to publish a letter in our excellent contemporary, the Philadelphia *Ledger*, in which he charges that Mr. Seely signaled his arrival in that city, to investigate the water gas operations, by asserting that he had come "to prepare a sensation article, and that his stay was marked, while in that city, by a long confidential interview with one of the officials of the city gas works." The engineer gives these as the reasons why he could not accord to Mr. Seely the privilege of manipulating the works. He thought also that Mr. Seely "might possibly—either ignorantly, if not willfully—disarrange the apparatus." If Mr. Seely is such an extraordinary character as is here represented, and made the "sensation" assertion here imputed to him, it would show conclusively that he was wholly unfit, scientifically and morally, to undertake such an investigation. But Mr. Seely made no such announcement. It is wholly unlike him, and is utterly inconsistent with all the facts of the case. As to the fears of the engineer that Mr. Seely might ignorantly or otherwise disarrange the apparatus, those who know Mr. Seely as a practical chemist, and his high character for honor and integrity, need not be told of the perfect absurdity of the engineer's fears.

Mr. Seely did have an interview with one of the officials of the city gas works, but not until he had exhausted all the privileges that were accorded to him by those in charge of the water gas works. He purposely avoided all intercourse with any one who was even suspected of hostility to water gas, until he had concluded his investigations. When parties feel obliged to resort to such tricks as the above, in order to support their cause, it suggests the suspicion, at least, that they must have a bad job on hand.

A GREAT REFORM COMMENCED.—We are pleased to find that the practice of having the scholars learn all their lessons during school hours has been adopted in a portion of our public schools, and it will, doubtless, be extended to them all. We hope that this step is but the beginning of a great reform, and that the whole practice of stuffing the mind with a mass of undigested matter will be abandoned. An eager desire to make a great show for the time or for the money expended is the most pernicious vice of our educational system; it leads to a hasty slurring over of lessons half understood, and begets a habit of being satisfied with vague ideas which is very apt to continue through life. The most rapid mode of teaching is that which requires every lesson to be thoroughly mastered and comprehended before it is passed by. A scholar with this habit of study will soon overtake another who is far in advance

with crude and superficial notions of his studies. If parents or teachers are very anxious that a child should learn rapidly, let them insist that the lessons shall be few and short; no more than the child can learn both thoroughly and easily.

PATENT AGENCY DEPARTMENT—EXTENSIVE ARRANGEMENT FOR 1861.

The editors and proprietors of this journal desire to return their warmest thanks for the unbounded confidence which has been bestowed upon them by the inventors of the United States. During the year, now near to its close, the business of their office has largely augmented, and they confidently look towards the opening of a new year for a large increase in the amount of their professional business.

They will continue, as heretofore, to procure patents in the United States, Great Britain, France, Belgium, Holland, Austria, Russia, Prussia, Spain, Sardinia, and other countries where patent laws exist. In connection with their home and foreign offices, they have also a branch office opposite the Patent Office in Washington, and which will continue, as heretofore, under the special charge of one of the firm, and is now reorganized on a still more efficient basis to attend to all matters of our clients where personal intercourse at the Patent Office is important. With the view of placing the Patent Office department of their office upon such a basis as to promote to the fullest extent the best interests of inventors and patentees, the proprietors, Messrs. MUNN & Co., will not only continue to prepare Specifications, Drawings, Caveats, Assignments, Licenses, &c.; attend Rejected Cases, Re-issues, Extensions, Interferences, Disclaimers, Appeals, &c., but will also advise with patentees and assignees upon all questions of infringement, even to the prosecution of suits in the United States courts. Their arrangements for this and every other branch of professional business are complete, and parties who wish to counsel with and employ them can rely upon their utmost fidelity, and also upon such charges as will enable all patentees to seek the protection of the law in defence of their just rights.

Inventors and patentees will promote their best interests pecuniarily and otherwise by availing themselves of the extended facilities of this agency, which is acknowledged to be the largest and most efficient in the world. The experience of Messrs. MUNN & Co. extends over the past sixteen years, during which time thousands of inventions have been patented through their agency.

ANECDOTES OF THE STEAM ENGINE.—In our next number we shall commence a series of articles on "The Early Inventors of the Steam Engine." These papers will be illustrated with handsome engravings of all the old steam devices and engines that have been invented from the days Hero, of Alexandria, who lived 300 years before the Christian era, down to original steam engines of the Marquis of Worcester and the immortal James Watt. The information will be selected from rare and authentic documents, and will contain curious and useful historical anecdotes and mechanical data, well calculated both to instruct and amuse the general reader.

MIRRORS FOR THE CAPITOL AT WASHINGTON.—Thirty beautiful mirrors and fifteen cornices have been prepared at the establishment of B. W. Merriam, No. 84 Chatham-street, this city. The largest mirror is eight feet eight inches in height by sixty-eight inches in breadth. It is surmounted by a figure of Washington delivering his inaugural address. The other mirrors range from four feet eight inches to five feet eight inches in height. The fitting, molding and gilding were all executed at the above establishment, and the whole style is rich and appropriate.

TO PAPER MANUFACTURERS.—Since the introduction of envelopes, the outside leaf of most letters and notes is useless and wasted. People generally, to avoid the appearance of meanness, use a whole sheet, when a half one would answer every purpose. What is wanted to remedy the evil is, that paper manufacturers should manufacture letter and note paper in substantial half sheets; also, a stamp might be put in the center of the sheet, at the top, instead of on the corner as is now done, so as to distinguish it from the whole sheets.

A FOAM BREAKER.

Messrs. Editors:—On page 261 of the present volume of the *SCIENTIFIC AMERICAN*, I notice a description of a "foam collector" for a steam boiler, which has led me to send you an account of a simple foam breaker, used very successfully, where nearly the whole contents of the boiler (it being of a gummy nature) would otherwise have been converted into foam. It may be of use to some of your readers. It consisted of a division in the boiler a short distance above the liquid, nearly flat on top end, slightly inclined from level, with a large valve near the middle opening upward, and a hole toward the lower end of the plate dividing the boiler, into which a pipe was tightly inserted long enough to extend down through the boiling liquid nearly to the bottom of the vessel. The valve was loaded to perhaps one-eighth of a pound to the square inch, and was opened near one-eighth of an inch by the passage of the steam and foam. The globules of foam or froth being driven with considerable force against the valve and through the contracted aperture into the upper chamber of the boiler, were broken, and the liquid composing them, passing down through the pipe, returned to the boiler below. J. M. S.

Chester, Pa., November 8, 1860.

THE HOOSAC TUNNEL.—A steam engine is being put up at the shaft for the purpose of more readily drawing to the surface the rock and water. In five days, having stopped work in the shaft in order to put up the engine, the water has filled up the hole 100 feet deep. The experiments previous to the destruction of the new machines for drilling, by the burning of the Globe Locomotive Works, gave very encouraging indications of success. It was found to be practicable to drill in the hardest granite at the rate of one inch per minute, which is considered equal to three inches per minute in the Hoosac rock, and more than ten times as rapid as hand drilling.

RAW mellow apple (says Hall's *Journal of Health*) is digested in an hour and a half; while boiled cabbage requires five hours. The most healthful dessert is a baked apple. If taken freely at breakfast, with coarse bread and butter, without meat or flesh, it has an admirable effect on the system, often removing constipation, correcting acidities, and cooling off febrile conditions better than medicine.

THE ELECTRIC TELEGRAPH IN INDIA.—The telegraph which crosses the Kistna river, in India, is a galvanized iron wire rope $1\frac{1}{2}$ inches in circumference. It is made of three strands of wire twisted together, each strand having seven wires. It is carried from rocks 400 feet high above the river, and is secured to large posts of teak wood. The distance between the two points of support is 6,000 feet; the cable curves down at the middle to 60 feet above the water. It has been in operation for about twelve months.

In 1700, Yale library contained but 40 volumes; in 1766, 4,000; in 1835, 10,000; and in 1860, 38,000. Added to this last number, the Linonian Brothers' Law and Medical libraries in the same building make a total of 67,000 volumes, under the care of Yale College, while the number of unbound pamphlets is estimated at 7,000. The oldest printed book in the collection is a copy of the tracts of St. Augustine, printed in Zurich in 1467.

THE GREAT EASTERN.—The *London Engineer* states that the owners of the *Great Eastern* have received \$70,000 from the New York consignees, though the accounts have not been closed to show the results of the trip to this country. It is however expected that the receipts from passengers and visitors will very nearly cover the expenses.

LAKE SUPERIOR MINES.—We learn by the *Miner*, that up to Oct. 18 last, 3,085 tons of copper have been shipped this year from the Lake Superior region. This is more than was shipped last year. All the mines seem to be in a prosperous condition. All the companies are increasing the number of their stamps.