Scientific American.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW, NEW YORK

O. D. MUNN. A. E. BEACH.

TERMS.

One copy, one year - - - - - - - - $3 00
One copy, six months - - - - - - - 1 50
CLUB RATES { Ten copies, one year, each $2 50 — 25 00
{ Over ten copies, same rate, each — 2 50
TO BE HAD AT ALL THE NEWS DEPOTS.

VOL. XXVII., No. 9. [NEW SERIES] *Twenty-seventh Year.*

NEW YORK, SATURDAY, AUGUST 31, 1872.

Contents:

(Illustrated articles are marked with an asterisk.)

TERRESTRIAL MAGNETISM.

The old notion that the earth possessed, near its north pole or in its interior, strong magnets which attracted the poles of the compass needle has long ago given place to the theory that our whole planet must be considered as a large magnet, and to the later hypothesis that this magnetism is caused by electric currents running east and west through its crust, and in regard to which the compass needle behaves as it does to all electric currents, namely: it places itself at right angles to the same, according to the law discovered by Oersted in 1829. By this theory the declination of the compass needle from the geographical north is simply explained by the fact that there is no cause which should compel these currents to run exactly east and west; on the contrary, by the irregular formation of the earth's crust, it cannot be expected otherwise than that these currents, which always follow the path of least resistance, should not coincide with the geographic parallels, and that consequently the direction of the compass needle, which must be at right angles to these currents, cannot coincide with the geographic meridians. This being the case, it is evident that the magnetic pole cannot coincide with the geographic pole, and in fact observations in high northern latitudes on this hemisphere have decided that, at present, the magnetic north pole, that is the point towards which the compass needle points, is situated in the arctic archipelago north of the American continent, in longitude of very near 100° west of Greenwich, and a latitude of 73° N. The magnetic south pole, in regard to latitude, is very near to the antipodes of this point, being in 74° S., but in regard to longitude, this is not the case; the antipodal point of 100° W. longitude lays in the meridian of 80° east of Greenwich; but the fact is that the magnetic south pole is at present at 140° east of Greenwich.

We can, of course, draw lines on the globe through those places where the compass needle points to the magnetic pole; in other words, when we travel from any place on earth and follow the direction of the compass needle till we reach the magnetic pole, and draw the line traveled over on the globe, we shall have a magnetic meridian. Those magnetic meridians can, of course, nowhere coincide with the geographical meridians, but must intersect them continuelly. Other systems of magnetic curves have been drawn; for instance, those of equal declination, that is, such curves as unite points where the declination of the compass needle from the geographic pole is the same. Those lines are quite irregular, much more so than the magnetic meridians, and even exhibit a great complexity. The line without declination runs from the magnetic north pole, south through Hudson's Bay and Lake Erie to Virginia, and enters the ocean in North Carolina; it skirts the Antilles and crosses the eastern point of South America. East of this line, the compass needle points north towards the west, and west of this line, it points north towards the east; and it generally deviates more in proportion as we go to greater distances from this line without declination; so while at present in Maine the declination is some 20° west, and in California, 20° east, it is in Newfoundland 40° west, and in northern Alaska, 40° east.

The reader will have noticed that we have used several times the expression "at present." This was by reason of the singular fact that all these data are continually changing. Observations made since the last three centuries and recorded on maps, for the years 1600, 1700, 1800, and 1870 prove that the magnetic poles are continually shifting their position; and this shifting is taking place regularly from east to west. Thus, in 1600, the magnetic north pole was somewhere north of Europe, and the line without declination ran through the heart of that continent, so that in the western European countries the declination was from 5° to 10° east; then it proved to be moving westward, so that the line of no declination passed over England some 100 years later, when the declination for the whole of Europe became west and was increasingly so till about 1820, when it had reached about 24°. Since this time, it is diminishing again in degree, while in the Eastern States of America it is increasing, so that in New York city, where a few years ago it was 6°, it is now more than 7° W. This points to a regular travel of the magnetic pole around the geographic pole, and, as far as we may conclude from a rather premature estimate, it will take a little over 600 years for a complete revolution, so that in the year 2200 it will again have arrived in the north of Europe.

There are two theories in explanation of this surprising phenomenon; one is that a great portion of the earth's magnetism is due to induction from celestial bodies and therefore under their influence, so that the relative position of the planets may affect the earth's polarity. The other theory, quite recently brought forward, is that the upheaval of continents and islands and in general all changes in the earth's crust, which are especially veryactive near the poles, modify either the magnetism or the direction of the electric currents which are the causes of the same.

In closing, we cannot forego drawing attention to two significant facts. One is that the aurora borealis appears to proceed always from the magnetic and not from the geographic pole as a center; the other is that the magnetic pole appears to coincide with the point of greatest cold, and even that the lines of equal mean temperature, or the so-called isothermal lines, when drawn on the globe, show such a close relation to the magnetic pole as to give evidence that they are to a great extent governed by the same fundamental law.

THE INTERNATIONAL EXPOSITION AT VIENNA, 1873.

In reply to inquiries for the name of the United States Commissioner for the above exhibition, we would state that Thomas B. Van Beuren, Esq., 51 Chambers street, New York, is the proper address. All persons who are desirous of going to the trouble and expense, of shipping their goods to Austria for this show, should communicate with the Commissioner as above. It is stated that there will be but few American exhibitors. This is not to be wondered at when we consider that under our present financial conditions—due, as the free traders allege, to our taxes and high tariff—it is not possible for Americans to compete with Europeans in filling orders for manufactured goods. It is, therefore, useless for our people to go over to Austria to exhibit the products of their skill and ingenuity. The only practical result would be that our best patterns would be copied without benefit or reward to the American maker. He could fill no orders, export no goods, simply because the continental manufacturers can do the work much cheaper and underbid his best proposals. When prices advance on the other side of the Atlantic, or become reduced here, then will be the time to talk to our people about going abroad to show their goods.

As for the exhibition of new inventions at Vienna, the Austrian patent laws offer but precious little encouragement and protection for American inventors, as we have heretofore had occasion to explain.

TUNNEL UNDER THE HARLEM RIVER, NEW YORK

The Park Commissioners of New York city contemplate the construction of a large tunnel at the upper end of the island, for the purpose of providing a carriage way under the Harlem river, from the end of the Seventh avenue drive. This is an excellent improvement and we trust will be speedily carried out. It will furnish a much needed communication between New York city and Westchester county. At the present time, the only avenues of access are the draw bridges, which occasion frequent delays, not only to the general traffic but to the railway trains.

The tunnel will be built of solid masonry, and extend 1,663 feet on the New York side, and 1,078 feet on the Westchester side of the river. It is contemplated to have the top of the arch 18 feet below high water mark, so that vessels drawing 17 feet can pass over safely. The tide falls about five feet at that point; and at low tide, vessels drawing less than 13 feet will be able to pass over in safety. It is proposed to have the tunnel about 2,759 feet long, and 16 feet in hight, to permit persons to stand on top of the highest omnibus, and 34 feet in width; this affords 20 feet of wheeling space and seven feet on each side for foot passengers. The descent will begin at 150th street, and the top of the tunnel will strike the water bed at 155th street, at a point about 200 feet south of the present Macomb's Dam bridge. The descent will not be steeper than many of the roads in the Central Park, and will not inconvenience horses drawing heavy loads. The expense is estimated to be about $1,500,000. A. W. Grant, C. E. is the engineer of this important work.

WILLIAM BRIDGES ADAMS.

We regret to have to record the decease of this distinguished civil engineer, inventor and scientific writer, whose name and works are doubtless familiar to our readers. He died recently, in England, the land of his birth, at the age of 75 years. Many of his suggestions in respect to railway improvements have been brought into common use, and among them is the so called fish joint, for uniting the ends of rails.

The employment of light steam cars and carriages is becoming every day more common. Their practicability was perhaps as completely demonstrated by the late Mr. Adams as by any other one person. We find in *Engineering* the following particulars concerning the performances of one of the early vehicles of this kind, made by Mr. Adams:

The total length of the carriage was 12 ft. 6 inches, including machinery, water tank, and seats for seven passengers, all being placed on one frame, which was hung below the axles, and carried on four wheels, 3 ft. 4 inches in diameter. The floor was within 9 inches of the level of the rails. The engine had two steam cylinders, 3½ inches in diameter, and 6 inch stroke, acting on a cranked axle. The boiler was cylindrical, placed vertically, and was 1 ft. 7 inches in diameter by 4 ft. 3 inches high. It contained a firebox, 16 inches in diameter by 14 inches high, with 38 tubes, 3 ft. 3 inches long by 1½ inches in diameter, giving 5½ ft. of heating surface in the firebox and 38 ft. in the tubes. The water tank was placed under the seat, and had a capacity of 40 gallons.

The number of miles run during the half year, ending July 4th, 1848, was 5,526, the quantity of coke consumed being 7 tuns 9 cwt., or at the rate of 3 lb. per mile. At the date of this extract, the engine had run altogether about 15,000 miles; the greatest speed attained on the level was 41 miles an hour, the ordinary speed that might be safely calculated on for a long journey being 25 miles an hour. She had performed the journey from London to Cambridge, a distance of 57½ miles in 1¾ hours, being at a rate of nearly 33 miles an hour, with a consumption of coke of 2¾ lb. per mile. This carriage was subsequently named the *Express*, and was sent down to Birmingham to be experimented with, where, to the astonishment of some of Mr. Samuel's friends—who had planned the matter—she ascended the Lickey incline of 1 in 37

SECURITY AGAINST THIEVES.

A bold bank robbery was committed not long ago at Uxbridge, Mass. The thieves surrounded the cashier's house in the dead of the night, and by means of ladders entered the open windows of the second story. They then gagged all the inmates, compelled the teller, on pain of death, to go with them to the bank and open the safe, which they immediately plundered. Loss, thirteen thousand dollars.

"The moral of the affair is," says *Appleton's Journal*, "that cashiers and tellers of banks must cease to go to bed with their chamber windows open, and that banks in the country must resort to some means of defense and protection more efficacious than the locks of a patent safe. An armed man and a stout dog in the Uxbridge bank would have prevented this robbery, and in the long run, it would be cheaper for a country bank to pay for a permanent night watchman than to be robbed, even if only once in a generation. The Uxbridge robbery is one of a series of similar outrages which have been perpetrated on the banks of New England during the last five years, and their frequency shows clearly that banks in the country cannot exist much longer in the old primitive fashion, but must fortify and arm themselves if they would keep their treasures safely."

We do not quite agree with the *Journal*. Instead of the dog and watchman, our advice to the banks is to make use of the better and surer means of protection which our ingenious inventors have provided in the shape of electrical alarms and detectors. For a tithe of the cost of maintaining a sleepy watchman, the Uxbridge bank might have had electric wires, attached to its doors and safes and also to the doors and windows of its cashier's dwelling, so arranged that any attempt of a burglar to enter would have rung an alarm bell and aroused the whole town. Entrance through open windows may be guarded by the use of a fly net to be connected with the wires. Any attempt to pass the net sounds the alarm. With the other forms of window, door, and safe alarms, our readers are familiar. We are never very sorry to hear of a bank robbery where the owners and officers have been so parsimonious as to refuse to employ the best electrical burglar alarms. Many of them turn up their ignorant noses at the idea of using such "patent gimcracks," as they call them, about their premises. But they must either use them or submit to robbery. Some of the heaviest and most astounding bank robberies have been committed upon banks that employed special watchmen at great expense, who were overpowered by the thieves, or were absent from their posts at the critical moment. But we have yet to hear of a single example of bank robbery where the electric alarm was properly applied.

THE INTERNATIONAL STATISTICAL CONGRESS.

The International Statistical Congress has opened its eighth session in St. Petersburgh, Russia. The delegates are divided into four sections, to each one of which the following subjects are assigned for consideration and report: To the first section, statistics of population, with methods of obtaining the same. Under this head, the number, sex, trades, and ages of the population of various countries will be discussed, together with the moral, intellectual, and physical condition of the people. Comparisons will also be made with reference to determining whether retrogression or progression has been made from a former state. To the physical development of man will be given considerable prominence. Investigations on this subject will include the hight, weight, volume, and development of different parts of the body, the strength, rate of walking, respiration, pulse, beating of the heart, and comparative acuteness of the senses.

To the second section, the most important part of the labor of the Congress is assigned. This is the discussion of industrial statistics. The subject is divided into five classes: Agriculture, mines and quarries, commerce and fisheries, and

manufactures. These are subdivided so that no detail, however small, will be omitted.

The third section will discuss the statistics of commerce and postal relations. Many difficulties to the accomplishment of this work are anticipated. The principal is that of fixing a uniform nomenclature for the leading articles of commerce, without which it is almost impossible to arrive at satisfactory results, and also that of obtaining the true values of merchandise for use as a basis of comparison between aggregates. The fourth section will devote itself to discussions similar to those of the Prison Congress lately held in England—the statistics of criminal justice.

The more than ordinary importance of this Congress will render its proceedings of great interest, and we look for much valuable information from the results of its deliberations.

A NEW CANAL STEAMER.

We published not long ago illustrations of Captain Goodwin's improvement in canal propulsion, and spoke of it as one of the plans most likely to prove practical and successful. We are gratified to be able to state that a pair of these canal boats have lately been constructed by the inventor, at Buffalo, and in the course of two or three weeks they are to be put on trial on the Erie canal.

The peculiar features of the plan are, first, a floating propelling wheel, extending entirely across the bow of the boat, somewhat like those employed at the sterns of the Western boats. Second, cheek pieces extending alongside of the bow wheel, so as to enclose the water in front and cause it to be driven under the bottom of the boat as the latter advances. Third, a peculiar formation of the stern of the vessel, so as to admit of the connection therewith of a train of barge boats, which when united shall form a unity, so far as propulsion is concerned.

The two boats just built are each 96 feet long by 17 feet wide, and will have a carrying capacity each of 240 tuns The engine is of 40 horse power, capable of working up to double that power if required. It is expected that the two boats when connected will be propelled with a speed of from four to six miles per hour. Of the actual performances of the vessels, we shall give a report in due time.

THE NEW RAILWAYS ACROSS THE CONTINENT.

Colonel Thomas A. Scott, the celebrated railway projector and manager, recently made a speech before the wealthy men of New Orleans, inviting them to join in the construction of a railway from New Orleans to Shreveport, for the purpose of connecting New Orleans with the Texas & Pacific Railroad, of which Colonel Scott is president. In the course of his remarks, Colonel Scott stated that the Texas and Pacific Railroad, the construction of which is now rapidly progressing, will extend from Shreveport, La., to San Diego, Cal. There will also be a parallel connecting line, beginning at Texaskana, and running westerly to Fort Worth, in Tarrant county, Texas, where it joins the trunk line. Colonel Scott stated that the entire line from Shreveport to San Diego will be finished within six years, and if the citizens of New Orleans now join in the construction of the proposed road from New Orleans to Shreveport, they will be enabled by or before the year 1878 to take the cars in their own city and ride direct to the Pacific ocean. The Texas and Pacific Company expect to have five hundred miles of their road completed within the next two years. The portion of Texas through which it passes is very rich in agricultural and other productions.

Still another new transcontinental railway enterprise is in progress, that of the Atlantic and Pacific Railroad Company, lately incorporated under the authority of the Legislature of California. The line is to be located south of the snow line, so as to avoid the detentions which so seriously interrupt the Union Pacific in the winter time. This road is intended to connect with the Atlantic and Pacific Railway of Missouri, a portion of which, over three hundred and fifty miles in length, is already in operation west of St. Louis. It is asserted that the city of San Francisco will subscribe heavily towards this new road, as the citizens have become alarmed by the efforts of the Central Pacific Company to concentrate the entire railroad system of the State in their own hands, with the terminus at Goat Island—a project which, besides establishing an immense moncpoly, is claimed to threaten the destruction of the present harbor of San Francisco, and the building of a rival city on the opposite side of the bay.

When these new highways are completed, we shall have four great railway avenues in operation across the continent, to wit, the Union Pacific, the Northern Pacific, the Texas and Pacific, and the Atlantic and Pacific.

IMPROVEMENTS THAT ARE MUCH NEEDED.

The steamboat Bristol, one of the large and magnificent vessels that navigate Long Island Sound, plying on the Boston route between New York and Fall River, lately collided at Newport, during a fog, with a ship lying at anchor. The sailing vessel, which was loaded with railroad iron, was cut down and sank, while the steamer was damaged in the bow and was run ashore to prevent sinking. As it was, her hull filled. Steam pumps were sent for, which, in a few hours, set the Bristol again afloat and she was soon repaired.

The Bristol is a noble vessel. She was built at an expense of one million of dollars, with first class boilers, engine, blowers, indicators, hose pipes, etc. Her cabins are elegantly upholstered, adorned with gilt, lighted with gas; her twelve hundred passengers are entertained, during every trip, by regularly employed bands of music, are supplied with good things from a generous larder, and served by an effective corps of the politest negro waiters. In short, the vessel is a floating palace, sailing with almost every appointment and luxury that money can supply. But in one most important requisite, namely, the means of flotation, the Bristol is sadly deficient.

The ordinary mechanic, not experienced in navigation, if asked to give his ideas as to the prime requisites for a passenger steamboat, would naturally say that the first thing to do was to provide the most ample means possible for keeping the ship afloat. But it is just here that owners disagree with him, and the Bristol is a case in point. With an operating steam force on board of nearly three thousand horse power, she was unprovided with the means of rendering her power available for pumping, and sank ignominiously into the mud.

A decent regard for the lives of passengers, to say nothing of their own property, would seem to make it the obvious duty of the owners of the Bristol to provide her with pumps, equal, at least, to an emergency like that lately encountered. Had the accident occurred on the open Sound, instead of near the bank of a river, the vessel would doubtless have gone to the bottom, with loss of many lives.

We are aware that owners are desirous of avoiding the transport of dead weight, and hence they economize in pumps and other safety apparatus. But we believe it to be poor economy. They should place on board the most effective means for safety that can be procured, calling upon ingenious people to remedy any defects that experience suggests. The invention of improved means for the flotation of vessels in case of disaster is still urgently demanded.

We trust that some of our readers will investigate this subject specially, and study out some new and effective method of rendering available for safety, in the hour of need, the immense steam force of such vessels as the Bristol. The dimensions of this boat are as follows: Length 373 feet, beam 83 feet, depth 16 feet. Measurement, 3,000 tuns. Diameter of cylinder 110 inches, stroke 12 feet, 2,800 horse power.

A NEW SUSPENSION BRIDGE.

The plans for a new suspension bridge over the Harlem river, at the high grounds in the upper part of New York city, have been prepared by the Park Commissioners. The bridge, as laid out on the drawings, will be about 1,800 feet in length, of which 734 feet will be within the jurisdiction of New York, and 1,066¼ feet in Westchester county. The roadway will be about 153 feet above high water level, and extend from the Tenth avenue to the hights on the opposite shore, west of the Croton aqueduct. It will be twenty-three feet higher than the present High Bridge, and form a convenient connection between the elevated lands of both sides of the river, affording favorable ground for foundations for piers and towers, and for anchorage for cables.

THE ELECTRICAL RAILWAY ALARM.

The bell rope commonly used on our railways, while it is very serviceable for short trains, is not of much use on long freight trains, because the weight and friction of a long cord is such that the rear portion of the cord may be broken without moving the forward portion. Thus, if the coupling of the rear cars of a long freight train breaks and the train separates, no alarm will be sounded on the engine gong, because the rear portion of the cord breaks while the front portion, to which the bell is attached, is not moved. An improvement which overcomes this difficulty consists in placing a magnetic bell hammer upon the engine, together with a small electrical battery, and in providing each car with a set of wires, joined by flexible joints, so arranged that while the train remains united all is well; but should any of the car couplings or wires break, the gong on the engine will instantly commence ringing. The same device may be employed by the conductor to give any signals that he may desire to the engineer, from any part of the train.

OLD AND NEW STEAM ENGINES.

The engines of the Cunard steamer *Scotia*, a large and splendid ship which plies between New York and Liverpool, are of 5,000 horses power, 100 inch cylinders, 12 feet stroke, very massive, elegant to look at, but of old style, side levers, entirely out of date, and very expensive to run. The ship burns 160 tuns of coal a day and requires 1,900 tuns for an Atlantic voyage. The new style of compound engines, now used on most of the ocean steamers, effects a saving of more than fifty per cent in fuel. Mr. F. J. Bramwell states that, nine years ago, the average consumption of fuel of the best marine engines was 4½ pounds of coal per horse power per hour, and that the same results are now obtained with a consumption of a trifle over 2 pounds of coal per horse power per hour. This is a wonderful improvement. The owners of the *Scotia* would make money by throwing away their present engines and substituting the new patterns. They might thus save 1,000 tuns of coal per trip, and add 1,000 tuns to the cargo capacity of the vessel.

THE COOLEST PLACE IN NEW YORK.

The coolest place to be found in New York in the summer time is the Pneumatic Underground Railway Tunnel, under Broadway, opposite the City Hall Park. When the thermometer stands at 90° in the shade on the street, if you go down into the pneumatic tunnel you find a temperature of only 65°. The projectors of this tunnel enterprise, which is pretty generally admitted to be the best plan for rapid city transit that has been presented, are obliged to wait the sanction of the State Legislature before proceeding any further with the work. Meantime that portion of the tunnel which has been constructed under Broadway continues open to the public and forms a cool, clean, well lighted promenade, being withal an interesting place to visit. A narrow gage railway track is laid in the middle of the tunnel, in which a comfortable passenger car sometimes runs, being propelled on the pneumatic plan with much success. The great earth-boring machine remains motionless in the south end of the tunnel, waiting the legislative voice to give it renewed activity.

PROMOTIONS AT THE PATENT OFFICE.

W. Burke, lately first assistant examiner in class 25 "Clay and glass manufactures," has been appointed Principal Examiner in class 121, "Steam."

J. Newland, lately first assistant examiner in class 126, "Calorifics," has been appointed Principal Examiner in classes 61 and 98, "Hydraulics and Pneumatics."

Both of these appointments are the result of competitive examinations which were highly creditable to the successful candidates. Both are gentlemen of ability, and their appointment to the higher position they now occupy gives general satisfaction. They are well qualified, zealous, and industrious officers.

DIAMONDS IN ARIZONA.

Fabulous stories are told in the daily papers concerning the recent discovery of emeralds and diamonds in Arizona. Large quantities of these precious stones, found by prospecting parties, have been carried to San Francisco and put on exhibition. A great area of the territory where they are found has been secured and several joint companies formed, based on great expectations in the acquisition of diamond wealth. The richness of the new fields is alleged to surpass those of South Africa, and the famous mines of Golconda are dwarfed into insignificance. If the half that is told of the Arizonian discoveries is true, real diamonds are about to become more common than the paste article, and the occupation of the artificial manufacturers will soon be gone. One of these companies, by name the San Francisco and New York Mining and Commercial Company, announces a capital of $10,000,000, of which a large proportion has been already taken. Probably a small amount of the stock yet remains unsold, which those who greatly want it can perhaps obtain, as a special favor, if immediate application is made.

The new diamond fields are located among the foot hills of the Pinal mountains in Arizona. The whole country round about is said to be rich in mineral wealth.

WHY IT HAS BEEN SO HOT.

The present summer has been characterized by unusual heats in almost every part of the Northern world, and all classes of philosophers, the weather wise especially, have been at their wits' end to account for it. Professor Tacchini has been making direct enquiries at headquarters, and has received the most satisfactory explanation. By means of spectrum observations and other carefully conducted experiments, he has discovered that for some time past our great luminary, the sun, has been throwing off immense and unusual volumes of magnesium gas from all parts of its surface. Magnesium is one of the most inflammable and fiercely burning substances in nature, when once set a-going, and the explanations of Professor Tacchini settle the whole matter. When the thermometer falls, it may safely be concluded that the supply of magnesium in the sun's atmosphere has diminished.

THE METEORS OF AUGUST TENTH.

The expected shower of meteors, predicted by the astronomers for August 10th last, did not make its appearance in the locality of New York. We observed few if any more meteorites on that night than on ordinary occasions; nor have we received reports from any quarter indicating that the earth went through the tail of any comet. It may be, however, that the plunge of our sphere into the cometary matter took place in the day time, the resultant meteors being then invisible.

TO RENDER METALS ELECTRIC.—T. Sidot has observed this phenomenon, and found that iron, silver, and aluminium, if the friction be sufficient, will give off electric sparks. To perform this experiment, take a perfectly dry tube of thick white glass and put in 15 to 20 grammes granulated silver, and 30 to 40 grammes pure bisulphide of carbon, and seal up the tube. On warming the tube slightly and shaking it in the dark, sparks appear in the interior, their number increasing with the violence of the agitation. The sparks disappear on immersing the tube in water.

CAUSTIC SODA.—A new method of preparing caustic soda is given by M. Tessié du Motay, in *Les Mondes*. One equivalent of sulphuret of sodium is mixed and fused with one equivalent each of caustic soda, hydrate of lime, and metallic iron (cast or malleable); when these substances are heated to redness, the sulphuret of sodium is completely converted into caustic soda, and sulphuret of iron formed. M. du Motay considers that the water of the hydrate of soda or lime is decomposed by the iron, which becoming oxidized, hydrogen is set free, oxide of sodium formed, and then sulphuret of iron; the soda being separated from the last named substance by lixiviation with water. In another process, the sulphuret of sodium is first converted into a basic phosphate of soda, and then into caustic soda by means of caustic lime.

The corporation of the city of New York have ordered a portrait of the late Professor Morse to be painted, to adorn the grand parlor, or Governor's room, of the City Hall.