Editorial Summary.

A SUBTERRANEAN WATER SPOUT.—A remarkable irruption of water took place recently in the Cole silver mine, Virginia city, Nevada. The tunnel is a little over 1600 feet in length and perfectly straight. Several successive outbursts of water have rushed through the tunnel, the last filling it up with rock for a distance of nearly 100 feet. At the last accounts, this had been cleared out by the workmen except about ten feet, and but little loose rock was then coming in; although a large stream of water, about thirty-five inches, was still rushing over and through the pile of loose rock obstructing the tunnel, with a loud roar, occasionally accumulating its force and thrusting the mass partially forward. A large cavern must have been formed at the head of the tunnel, as hundreds of tuns of rock have come from it; but it has not yet been explored. A curious effect is noticed from throwing in the daylight to the head of this straight tunnel by means of a properly placed mirror at the mouth. Persons at the further end are plainly distinguishable and whether dressed in black, blue or any other color, appear as white as snow—a ghostly sight.

MODERN GEMS.—The progress of human skill in the imitation of precious stones, and the gradual giving-out of the diamond mines of Golconda and India, have rendered spurious gems more abundant and more perfect in imitation than ever. Even expert connoisseurs are said to be sometimes deceived by certain classes of imitation gems; and so far as this is the case, the advantage of the genuine stones over the spurious in a merely ornamental point of view, has certainly been reduced to a very fine shade. A recent work on the subject states that but a small proportion of the gems now sold and worn are genuine, and that large quantities are made in Birmingham and Paris, sent to India, and sold by the natives to strangers as "gems from the mine." The steady progress of science in the re-composition of natural products leaves little room to doubt that man will eventually conquer this field also from nature and occupy it with more exquisite products of art.

SILVER MICA.—Puscher, of Nurnberg, has adapted mica very beautifully for decorative work, such as inlaying and metal-coloring. After purifying it by treating in thin sheets with a strong solution of sulphuric acid, it is silvered exactly like a looking glass, and appears like a most brilliant film of metal. The ease with which it is cut in shapes and laid superficially, together with the splendor of its appearance, may be imagined. For a dead silver white, it is heated to redness in a clay muffle—after cutting into the shapes required—when it loses most of its flexibility, and becomes white, but in single sheets remains partially transparent and flecked with gray spots. The latter, with the transparency, disappear when two or three pieces are laid together. Small fragments of it, or finely ground, may be sprinkled upon a freshly poured sheet or coating of gelatine, and then fixed by a varnish, with beautiful effect.

VELOCITY OF STEAM AND OTHER GASES.—Mr. R. D. Napier has demonstrated to his own satisfaction and that of others first theoretically and afterward by experiment, that the velocity at which steam will flow from a boiler through an orifice into a vacuum, is rather less than half of that given in all published tables, and that it is no greater into a perfect or partial vacuum (at a pressure of two or more atmospheres) than into the air. The general law is established, that a gas of any given pressure will rush into a gas of not more than half that pressure, at the same rate as into a vacuum.

BERNABE'S IRON COPPERING.—Admiral Viscount de Chabannes, at Toulon, writes in a published letter that not only is the adhesion of the iron and copper by M. Bernabe's process as employed in the arsenal of Toulon, so perfect that they are not started apart by hammering, bending or breaking, but that if a hole in the copper at any time occurs from abrasion, the part can be re-coppered on the spot, as effectively as before. If this means that a repair of this kind can be effected on a ship's bottom, the method may very well have all the value attributed to it.

THE HYDRAULIC PROPELLER.—We observe that Admiral Elliott, in a paper read before the Institution of Naval Architects, has come out very strongly in favor of the "Water-witch" principle as the future motive power for ships of war. He was as strongly sustained in the ensuing discussion by Sir Edward Belcher, and warmly encouraged by Mr. Scott Russell while Mr. Reed, Chief Constructor of the Navy, and others, opposed. Mr. Russell predicted that with time and perseverance the plan would certainly succeed in the end, and supersede the screw for the purposes of warfare.

THE IMPROVEMENT OF THE RHONE is prosecuted vigorously by the French Government. At nine points the river has been or is now being straightened, widened or deepened as the case required, so as render navigation safe and unimpeded. All efforts to improve the natural channel at the mouth having failed, a canal two miles long has been cut for an outlet to the sea; issuing from the river by a lock 500 feet long and 70 feet wide, and discharging into an open dock formed by two piers, each three quarters of a mile long.

MISCELLANEOUS.—Iron at an intense red heat is transparent to a slight depth.——The British Government have awarded Major Palliser $50,000 for his improvement in projectiles and propose to ask half as much more for him in their next year's estimates.

INGENIOUS LIGHT DRAFT STEAMERS.—A late paper by J. R. Napier explains the construction of some steam tugs and barges now building at Glasgow for the Godavery river (India) of a length of some 140 feet by 25 feet wide, and only one foot draft. The bottoms are made of galvanized cast steel plates only one eighth of an inch thick, fastened to longitudinal frames two feet apart. To stiffen a hull so long, light and shallow, the awning necessary under the tropical sun and rains, is made of galvanized one sixteenth inch steel plates, on frames similar to the bottom, but lighter and closer, and is made virtually a part of the hull, being connected with the vessel's bottom by two steel lattice frames placed about two thirds of the width of the vessel apart, and the whole structure is stiffened laterally by steel angle bars and diagonal braces. The propeller being at the stern, the boiler and fuel are placed in the forepart of the vessel to balance it. The engines consist of a pair of 11 inch cylinders with 4 feet stroke, supplied with steam at 150 lbs. pressure by a boiler nearly like that of a locomotive. The paddle arms are of wood, of a radius of 3½ feet, and have no rims or floats. Except a short forward deck for a steam capstan, warping pulleys and anchors for getting off sand banks, they are open boats, with a light floor of wood laid on the bottom frames. With 2½ feet of freeboard and 1 foot draft, their depth will be about 3½ feet.

CONCERNING SOUND.—The transmission of sound through solid metallic tubes is so perfect that conversation has been maintained in a low tone between the ends of one of the Paris water pipes 3,120 feet long. The velocity of the transmission of sound is greater, by four to sixteen times, in metals than in air, and in wood, as computed by Chladni, from ten to sixteen times greater; which is not so commonly known. Rock conveys sound so much faster than air that the ear applied to a stratum of rock in which blasting is being done at a distance, will perceive two distinct reports; that conveyed through the rock first, and afterward the ordinary report through the atmosphere. It has been found that the velocity is also proportioned to the loudness of the report, other things being equal. With 2,000 pounds of powder a report travelled 967 feet in a second; with 12,000 pounds, 1,210. The most notable observation lately made in the direction of reducing sound to form and measure, is the refraction of it by M. Sondhaus, by means of accoustic lenses made of spherical collodion envelopes filled with carbonic acid

THE BOXER SHRAPNEL SHELL.—Shrapnel is a spherical shell filled with powder and bullets. In the old kind the powder and bullets are mingled: the improved segment shell adopted in 1859, separates them, obviating the tendency to burst in or near the gun from the mutual collision of the contents on beng discharged. The Boxer scrapnel is a cylindrical iron case with the powder in a chamber at its base, where the walls are thick, and some 450 iron bullets in the forward part; thus resembling substantially a loaded cannon in itself. A trial was made at Shoeburyness, April 26th, to test the comparative effects of the improved shrapnel of 1859 and Colonel Boxer's invention. Three targets were placed one behind another, that in front presenting a surface of 9x54 feet. The Boxer, fired from a 9-inch gun with 30 lbs of powder, sent 142 balls through the front target, 46 of these through and 60 into the second target, and 26 of the latter through and 6 into the third target.

GUN COTTON has now taken a well-defined place in commerce and utility, and its manufacture has been so far perfected that its definite quality is as certain a result as that of gunpowder, its liability to spontaneous explosion has been obviated and, the rapidity of its combustion can be accurately regulated, It owes its present position to the combined exertions of three parties: Major Von Lenk, of the Austrian army, Mr. Abel, of Woolwich, Eng., and Messrs. Prentice, of Stow Market. The spontaneous chemical changes which have led to disastrous explosions, are characteristic of lower compounds, a very small percentage of which is liable to form under certain conditions in the tri-nitro-cellulose which constitutes the most perfect form of gun cotton. This is now prevented by Mr. Abel, by adding a little carbonate of soda which neutralizes the first result of change, consisting of a little nitrous acid, and all further decomposition is thus obviated.

DAW'S METALLIC CARTRIDGE—specially designed for breech-loading rifles—is cased in thin rolled brass, formed around a mandrel with two turns, the end cemented down, the base united with a metallic cover, and the whole made completely impervious to water. This cartridge is extolled in the English journals as the best, surest, cleanest, lightest and cheapest yet made.

A WELL-VENTILATED MEASURE.—The English journals inform us that on the night the reform bill was introduced, 1,500,000 cubic feet of air, comfortably warmed, passed through the House of Commons every hour. Fifteen miles of steam pipes are used in warming the two Houses.

BUSINESS AND MANUFACTURING ITEMS.

COTTON.—A French stocking machine now on exhibition is made to notify its attendant of the breaking of a thread by a very simple arrangement; each thread sustaining a small steel lever which drops when the thread is broken, so as to complete an electrical circuit and cause the striking of a bell.

IRON.—The reported failure of the Paris Bessemer steel bridge is denied emphatically. The apparent deflection of the center (which is a straight line) was an optical illusion.——Mr. J. Campbell Evans, of the Morden Iron Works, East Greenwich, Eng., has made a machine which rolls screws by means of three circular dies, set with the proper pitch, in such a manner as to rotate the red-hot bolt between them and shape the thread by their edges.

MINING.—The cost of English coal in human life in five years was, from 1856 to 1860, 5,089 lives for 381,000,000 tuns; from 1861 to 1865, 4,627 lives for 468,500,000 tuns.——Iridium is said to be among the minerals found in connection with gold in the Richardson Mine at Madoc, C. W. It is also found at Chaudière, together with platinum. It is a rare and valuable metal, of extreme hardness, and is in demand for pointing gold pens.——The falling off in the Australian gold fields has prompted the authorities of Queensland to stimulate new discovery by offering a reward of $15,000 for the discovery of any new gold field not less than 20 miles distant from any other already proclaimed within the colony.

RAILROADS.—It is proposed to consolidate the St. Louis and Iron Mountain Railroad, which runs southward from St. Louis through the great metalliferous region of southeast Missouri, with the Cairo and Fulton, which is designed to run from a junction with the former road to Cairo (30 miles from Cairo west having been heretofore completed), and thence to be extended southward to Belmont, opposite Columbus, Ky., which is the terminus of the Mobile and Ohio road. Some 100 miles of the line are yet to be built, though partly graded. St. Louis will thus get a direct connection with the whole southern system of railroads, and a route to New Orleans 700 miles long, or 500 miles shorter than by the river. So says the *Railroad Journal*.—Further particulars of Robertson's (Nevada) track-laying machine—pronounced in San Francisco a complete success—show the motory arrangements more clearly than we were enabled to obtain them from an imperfect newspaper report, a few weeks since. The leading necessity, a road for the machine that makes the road, is provided by placing the levelling, tie-laying and track-laying machinery forward of the trucks, on a projecting portion of the frame, forty feet long. The whole frame, 60 feet long, resembles the skeleton of a lattice bridge, and rests by its last 20 feet on low car trucks, over which are placed the engine and boiler, and the load of ties and rails. The latter are passed over the machinery as fast as wanted by endless chains and overhead travelling cranes, and laid as heretofore described, forming the track upon which the machine moves forward, while a tender train brings up the fresh materials without interruption of the work. It requires only 20 men, and lays track at the rate of six to twelve miles a day.—The Mont Cenis tunnel having passed through the quartz and entered upon a softer stratum, now proceeds much more rapidly. It is now more than half done, 4·129 miles having been tunnelled, leaving 3·461 miles yet to be bored.—The Russian Government is making surveys for great lines uniting the Baltic to the Black and Caspian Seas.—It is stated that a line of steamships is to be established between Hamburg and Aspinwall, commencing with monthly trips. Direct emigration to the Pacific coast as well as direct trade, from Germany, may probably be stimulated by such an enterprise.—A first-class carriage on the Great Northern Railway (Eng.) caught fire on the 26th of April last, when at full speed, and burned for fully ten minutes, until it became wrapped in flames, before the distressing situation of the passengers was discovered by the guard. Their signals, shouts and shrieks (a number were ladies) were of no avail whatever. Where were the rockets?

MISCELLANEOUS.—A commission appointed by the legislature of Maine is engaged in investigating the problem of restoring and preserving the fish, which have disappeared from the streams to a great extent in consequence of the erection of dams and manufacturing establishments.—Brown coal, or lignite, has been found in considerable beds in Middlesex county, New Jersey, between Keyport and South Amboy. The proximity of this coal to the city of New York, where it is calculated that it can be delivered at a cost of not over $2 a tun, will render the beds very valuable property, even if the coal is none of the best.—The Boston Fruit Preserving Company freeze fish solid in their establishment in a few minutes, and preserve them for an indefinite period. It is supposed that a large trade will be done in frozen and preserved fish. It is proposed to pack salmon in this way in the summer, when they are cheap, for winter sale.—A Los Angeles, Cal., olive-grower sold last year from seventy trees, occupying about 1½ acres of land, 2,800 gallons of oil for $1,400.—Coral for jewelry is said to have risen in value within five or six years from five dollars an ounce to one hundred; five or six times its weight in gold.—The *Caledonian Mercury*, established in 1662, and which claimed to be the oldest newspaper in Great Britain, on the 20th of April ceased to be published, after an existence of more than two centuries.—Coal is hereafter to be used exclusively as fuel on the New York and Erie Railroad, and the company have commenced selling off the wood they have on hand.—The New York City Railroads conveyed in 1866 nearly a hundred millions of passengers (93,907,682): an increase of over twelve millions from the previous year.—A shoal of from 150 to 200 bottle-nosed whales visited Musselburgh Bay, Scotland, on the 20th of April last, and were attacked by the Frith of Forth fishermen. After an exciting and protracted battle, witnessed by hundreds of spectators, 25 of the whales were brought ashore, measuring from 9 to 25½ feet in length.—A rich lode of bismuth has been discovered in South Australia, 200 miles in the interior. The product of the mine has commenced arriving in England.—The Franco-American Telegraph bill has been approved by the Governor of New York, and a certified copy has been dispatched to France where the Imperial Government, it is said, is ready to promote the enterprise in the most substantial way. The grantees are required to have the line in operation in two years; which is rather short notice.—It is said that a million of dollars is annually made by the sale of Florida cedar wood for lead pencils.