American Cements.

At the recent convention of the American Society of Civil Engineers, an interesting paper on American natural cements was read by Mr. F. O. Norton, from which we condense the following:

The principal deposit of the magnesian limestone producing a cement possessing hydraulic energy occurs in the town of Rosendale, Ulster Co., New York. It was first brought into use about the year 1823, in the construction of the locks and other masonry of the Delaware and Hudson Canal, which passes through that county. Its production has gradually increased until there are now made from one million to one million and a half barrels in each season, of about eight to nine months, or during the period of navigation on the Hudson River between Rondout and New York. It is the chief industry of a large section of country, its reputation is extended, and it is sold in most of the large markets of the United States.

There has been a general impression that the use of a very small amount of water in mixing cement gave greater resulting strength than when sufficient water was used to form a paste of the consistency of stiff mortar. The tests recorded prove that the dry mixture does give decidedly higher tensile strength in twenty-four hours after mixture, and that it continues to be stronger than the stiff mortar for some three months. But after that time the reverse becomes true; the curve of strength of the stiff mortar rises to and passes above that of the dry mixture, and the strength of the cement mixed as a stiff mortar continues greater than that mixed with very little water, and this is the case continuously thereafter.

The strength of Portland cement, unmixed with sand, is, of course, very great. It develops a large proportion of its ultimate strength in the first seven days, say from one-half to two-thirds.

Rosendale cement of the best qualities develops great hydraulic energy in twenty-four hours, being at that time equal to the Portland. The Portland then gains very rapidly upon it up to seven days, the difference between the two then being the greatest; at the end of a month, however, the strength of the Rosendale cement begins to approach nearer to that of the Portland, and the difference between the two seems to be continually reduced after that time, this referring to mixtures of pure cement.

For practical purposes, however, neither of the cements is generally used without an admixture of sand. The addition of sand to Portland cement reduces its strength rapidly.

This reduction of strength is, in round numbers, as follows: One part of sand gives mortar one-half as strong as pure cement; two parts, one-third; three parts, one-fourth; four parts, one-fifth; five parts, one-sixth.

This reduction of strength of Rosendale cement by the admixture of sand seems to be somewhat less. The strength of the mortar of Portland cement in the proportion of one of cement to two of sand is, at the end of six months, say 224 pounds to the square inch. The strength of a mortar of Rosendale cement in the proportion of one of cement to one of sand is, at the end of six months, say 257 pounds to the square inch.

Careful experiments made by General Gillmore, and published in the appendix to the last edition of his treatise on "Limes, Hydraulic Cements, and Mortars," give the quantities of mortar produced from the mixture of cement, sand, and water, in various proportions, and using different kinds of cement. Adopting these results, and assuming the cost of the Rosendale cement at $1.10 per barrel, and the best English Portland at $3 per barrel (the market prices, May, 1880), and the cost of sand at 5 cents per barrel, we find that a mortar of Portland cement, in the proportions of one of cement to two of sand, will cost per barrel $1.22.

We also find that a mortar of Rosendale cement, in the proportions of one of cement to one of sand, will cost 68 cents per barrel.

Summarizing the comparison, we find that a mortar of Rosendale cement, in the proportions of one of cement to one of sand, has a tensile strength of 257 pounds to the square inch, and costs 63 cents per barrel; and that a mortar of foreign Portland cement, in the proportion of one of cement to two of sand, has a tensile strength of 224 pounds to the square inch, and costs $1.22 per barrel.

Therefore, the mortar of Rosendale cement, one to one, is 34 pounds per square inch stronger, and 54 cents per barrel less expensive, than a mortar of foreign Portland cement one to two.

This seems to show that for all uses which will be served by a mortar of the tensile strength of 257 pounds per square inch, the Rosendale cement is economical.

The remaining question is, whether this mortar of Rosendale cement, one to one, is strong enough for the practical purposes to which it may generally be applied.

The facts which answer this question are that for fifty years past, and up to within a very short time, *all* the important masonry in this country has been laid with American cement. The great fortifications on the coast, the Croton aqueduct, the Boston aqueducts, both old and new, all the government dry docks, the lighthouses, the locks, culverts, and aqueducts on the Erie and other canals; all the masonry of railroad bridges, viaducts, and culverts, the sewers of our cities, the masonry of our gas works, many hundreds of miles of wrought iron water pipe lined and laid in cement; the mills and mill dams in various localities; in fact, nearly all the masonry built under water and out of water in the United States up to within a few years has been constructed with American cement.

Professor Kirchhoff's Views on Connecting Lightning Rods with Gas and Water Pipes.

The city gas company of Berlin, having expressed the fear that gas pipes may be injured by lightning passing down a rod that is connected with the pipes, Professor Kirchhoff has published the following reply:

"As the erection of lightning rods is older than the system of gas and water pipes as they now exist in nearly all large cities, we find scarcely anything in early literature in regard to connecting the earth end of lightning rods with these metallic pipes, and in modern times most manufacturers of lightning rods, when putting them up, pay no attention to pipes in or near the building that is to be protected."

Kirchhoff is of the opinion, supported by the views of a series of professional authorities, that the frequent recent cases of injury from lightning to buildings that had been protected for years by their rods, are due to a neglect of these large masses of metal.

The Nicolai Church, in Greifswald, has been frequently struck by lightning, but was protected from injury by its rods. In 1876, however, lightning struck the tower and set it on fire. A few weeks before the church had had gas pipes put in it. No one seems to have thought that the new masses of metal which had been brought into the church could have any effect on the course of the lightning, otherwise the lightning rods would have been connected with the gas pipes, or the earth connection been prolonged to proximity with the pipe.

A similar circumstance occurred in the Nicolai Church in Stralsund. The lightning destroyed the rod in many places, although it received several strokes in 1856, and conducted them safely to the earth. Here, too, the cause of injury was in the neglect of the gas pipes, which were first laid in the neighborhood of the church in 1859, shortly before the lightning struck it. The injury done to the schoolhouse in Elmshorn, in 1876, and on the St. Lawrence Church, at Itzehoe, in 1877, both buildings being provided with rods, could have been avoided if the rods had been connected with the adjacent gas pipes.

"If it were possible," says Kirchhoff, "to make the earth connection so large that the resistance which the electric current meets with when it leaves the metallic conducting surface of the rod to enter the moist earth, or earth water, would be zero, then it would be unnecessary to connect the rods with the gas and water pipes. We are not able, even at immense expense, to make the earth connections so large as to compete with the conducting power of metallic gas and water pipes, the total length of which is frequently many miles, and the surface in contact with the moist earth is thousands of square miles. Hence the electric current prefers for its discharge the extensive net of the system of pipes to that of the earth connection of the rods, and this alone is the cause of the lightning leaving its own conductor."

Regarding the fear that gas and water pipes could be injured, the author says:

"I know of no case where lightning has destroyed a gas or water pipe which was connected with the lightning rod, but I do know cases already in which the pipes were destroyed by lightning because they were *not* connected with it.

"In May, 1809, lightning struck the rod on Count Von Seefeld's castle, and sprang from it to a small water pipe, which was about eighty meters from the end of the rod, and burst it. Another case happened in Basel, July 9, 1849. In a violent shower one stroke of lightning followed the rod on a house down into the earth, then jumped from it to a city water pipe, a meter distant, made of cast iron. It destroyed several lengths of pipe, which were packed at the joints with pitch and hemp. A third case, which was related to me by Professor Helmholtz, occurred last year in Gratz. Then, too, the lightning left the rod and sprang over to the city gas pipes; even a gas explosion is said to have resulted.

"In all three cases the rods were not connected with the pipes. If they had been connected the mechanical effect of lightning on the metallic pipes would have been null in the first and third cases, and in the second the damage would have been slight. If the water pipes in Basel had been joined with lead instead of pitch, no mechanical effect could have been produced.

"The mechanical effect of an electrical discharge is greatest where the electric fluid springs from one body to another. The wider this jump the more powerful is the mechanical effect. The electrical discharge of a thunder cloud upon the point of a lightning rod may melt or bend it, while the rod itself remains uninjured. If the conductor, however, is insufficient to receive and carry off the charge of electricity, it will leap from the conductor to another body. Where the lightning leaves the conductor its mechanical effect is again exerted, so that the rod is torn, melted, or bent. So, too, is that spot of the body on which it leaps.

"In the examples above given it was a lead pipe in the first case, a gas pipe in the last case, to which the lightning leaped when it left the rod, and which were destroyed. Such injuries to water and gas pipes near lightning rods must certainly be quite frequent. It would be desirable to bring them to light, so as to obtain proof that it is more advantageous, both for the rods and the building which it protects, as well as for the gas and water pipes, to have both intimately connected.

"Finally, I would mention two cases of lightning striking rods closely united with the gas and water pipes. The first happened in Dusseldorf, July 23, 1878, on the new Art Academy; the other August 19, last year, at Steglitz. In both cases the lightning rod, the buildings, and the pipes were uninjured."—*Deutschen Bauzeitung.*

A Sea-going Steam Pilot Boat.

Unlike the Pilot Commissioners of New York and New Jersey, the Baltimore Pilots' Association have taken kindly to the use of steam pilot boats, and are having built for their use a first-rate sea-going steamer. The new vessel is intended to carry sea pilots, with fuel, stores, and accommodations for a month's cruise. The hull will be of iron, with close iron-bulwarks at each end, and, with iron siding, forming a quarter deck for about 68 feet of the middle run of the boat. The quarter deck will stand 3¼ feet above the main deck, which will extend about 30 feet from the stem and 20 feet from the stern. Both the main and quarter decks will have iron deck beams, and will consist of heavy pine deck stuff. The pilot house and captain's room will be on the quarter deck, where the boarding yawls will be carried. The length will be 113 feet between main posts, and 122½ feet over all; extreme moulded beam, 23 feet; depth, 12¾ feet; from base line to the top of quarter deck, 18 feet. There will be one iron athwartship collision bulkhead $\frac{5}{16}$ inch iron, braced, and one forward of the boiler. Coal bunkers on either side of the boiler hold 40 tons each. Below the quarter deck will be the main cabin, with 20 sleeping berths, wash room, mess room, kitchen, pantry, chief-engineer's room, and store rooms. The forecastle will contain 10 bunks, store rooms, etc. The vessel will be heated throughout by steam. She will have two masts, schooner-rigged, two 17 foot yawls, two 1,000 gallon water tanks, three anchors of 800, 500, and 175 pounds weight, 120 fathoms chain cable, and a pump brake windlass.

The machinery will consist of an inverted direct-acting compound engine, with 22 and 36 inch cylinders, 26 inches stroke, fitted with tubular surface condenser, and air, feed, bilge, and circulating pumps, one cylindrical return tubular boiler, to carry a working pressure of 70 pounds of steam to the square inch, an independent feed pump to supply boilers, wash decks, fire service, etc.

This pioneer sea-going pilot steamer is now building at Wilmington, Del., by the Harlan and Hollingsworth Company.

CLOTHING IN ITS RELATION TO HEALTH.

The ideas and scientific views of Prof. Dr. Gustave Jaeger, of Stuttgart, regarding the properties of animal wool, gain more and more in popularity with German scientists, and in one of the latest numbers of the *Homœopatische Monatsblatter* (Homeopathic Monthly), which appears in Stuttgart, Dr. E. Schlegel, a well known physician of Tübingen, has published an essay, in which he speaks of Professor Jaeger's theories as follows:

Among the discoveries that have been made during the last few years in medical science, some facts brought to light by Dr. Gustave Jaeger regarding the amount of water contained in the human body may prove to be of the utmost importance. In his paper concerning "The resistibility of the human body against epidemic diseases and the power of constitution," * Professor Jaeger has proved that the specific gravity of several individuals is very different, and that the state of the health of those individuals is closely connected with their specific gravity. The greater the weight of the human body in comparison to the space which it occupies, *i. e.*, the greater its specific gravity, the more it is able to resist epidemic diseases. Persons of a low specific gravity are taken ill from very insignificant causes, such as a cold, and are very susceptible to contagious diseases. Such persons have usually a certain fullness of body, and are even corpulent, but just that which gives them a great size is useless ballast, namely, fat and water. These substances endow the heaviest bodies with a comparatively low specific gravity, giving at the same time to the constitution little power of resistance.

Very different is the case with bodies of high specific gravity. Here neither fat nor water is superabundant, the flesh feels solid, and the bodily constitution possesses a high power of resistance. Professor Jaeger has investigated these differences of constitutional resistibility by comparing the specific gravity of a number of persons with their state of health. An accumulation of water in the tissues of the body he calls "Hydrostasis chronica," an expression which, as the whole discovery itself, reminds us of the teachings of the homeopathist Von Grauvogel respecting hydrogenoid constitutions, while the theory that a chronic accumulation of water in the body is the cause of many sicknesses is in perfect accord with the "Sykosis" described by Hahnemann, and afterward by Wolf.

The investigations and measurements of Jaeger are of an entirely new date, and we would not mention them here had not this discovery proved to be of the highest value for hygiene, and had not the conclusions of Professor Jaeger already been corroborated in a most remarkable manner.

If it is true, namely, that the specific gravity of the body is the measure of its resistibility of disease, and if it is also true that few bodies have this resistibility, because of an overabundance of fat and water, then the question arises, Have we any means of counterbalancing this superabundance and therewith heightening the specific gravity? The

* "Seuchenschutz und Constitutionskraft."

homeopathists know a number of remedies for so-called hydrogenoid constitution, the most important of which is "Thuja." These remedies have to be chosen according to the individual constitution, and have proved to be of more or less benefit, sometimes even effecting a perfect cure. Allopathists use also several medicaments which are useful in cases of "Sykosis," but none of these remedies are entirely satisfactory.

Professor Jaeger has now, by his careful investigation, discovered a simple and natural expedient for preventing the accumulation of fat and water in the system, which is suitable alike for rich and poor. It consists in adopting a new sort of clothing, we might call it a normal clothing.

The Professor has tested the value of his discovery upon his own person and members of his family, and so has the writer of these lines, who, after having the honor of making the acquaintance of Professor Jaeger in 1879, adopted, at his suggestion, the normal clothing, and recommended it to some thirty or forty persons since. The experiments made by wearing the clothing in the heat of summer and the cold of winter has proved highly satisfactory.

The normal clothing has two essential properties:

1. It consists exclusively of wool, avoiding all materials woven from plant fiber (cotton or linen).

2. It makes a strong point of keeping warm the middle line of the front of the body.

The principal peculiarity of Professer Jaeger's clothing is the exclusive use of sheep's wool, even avoiding pocket and other linings of cotton.

To every thoughtful person it will be a source of satisfaction to know that Professor Jaeger has chosen for the warming of the body only those means which nature has given for the same purpose to those mammals which are the most nearly related to man. The fittest and the most suitable always predominates in nature, and if, in this case, we inquire why hair and wool clothing are the best protection against cold, the answer will be found in the physical properties of these matters. A cover of wool is far more porous than that of plant fiber. The latter, if exposed to moisture, becomes thoroughly soaked with the liquid and sticks to the body, so that no air remains between, and only one smooth evaporating surface is formed, whereas a hair or wool cover being never entirely soaked does not cling closely to the body, but forms a surface which is broken by air bubbles, permitting a great quantity of moisture to pierce to the outside, where it can evaporate. Moisture from the outside is prevented from piercing through the cover to the body on account of the layer of air between the cover and the body, which offers a kind of resistance.

These properties of hair and wool clothing are very important, for the skin of each animal is a source of evaporation, and continually renders moisture to the air.

That difference which exists between plant fiber and wool in regard to the conductibility of heat, renders the superiority of wool clothing in regard to health still more evident. Wool is a bad conductor of heat, therefore wool clothing conserves the heat produced by the body, while cotton, and still more linen, permits this heat to quickly escape and eradiate. This fact accounts for the cool, chilly feeling produced in putting on linen clothing, while in putting on woolen no loss of heat is felt.

The conservation of the heat of body produced by woolen clothing has the consequence that the skin remains in a blood-rich state, and may perspire more freely than when exposed to a quick refrigeration by cotton or linen clothing.

To these important properties of wool, which are sufficient proof of its suitability for clothing, a new one has been added by Professor Jaeger's latest investigations, which we will only mention briefly, as an explicit description would occupy too much space.

Jaeger has proved that in our organism there are certain gaseous volatile substances, called by him "Duftstoffe" (odorous substances), which play a very important part, as yet undivined. He endeavors to show that the actions of our mind are mediated by these substances, and that they are continually rendered free in the acts of breathing and perspiring. He discerns two different groups of odorous substances—"Lust and Unlust Stoffe" (substances of pleasure and disliking). The first ones are exhaled during a joyful and agreeable state of mind, and produce this state of mind if inhaled. Just the reverse is true of the second ones. Whoever will take the pains can discover for himself that the evaporation differs according to the condition of the mind as well as the condition of the body. During joy and happiness the odor of perspiration is not disagreeable, while during anguish and great nervous excitement it is offensive. The substances of disliking have, therefore, a bad odor. In an atmosphere of these substances the vitality is lowered and disadvantageously influenced. This accounts for the fact that in a state of anguish and fear the body is more susceptible to contagious diseases. The inhaling of the "substances of pleasure" heighten the vital actions and improve the resistibility of the body against sickness. Jaeger has now discovered that "sheep's wool" attracts the "substances of pleasure" [this property must not be confused with the great capacity of wool for absorbing odors in general], while clothing made of plant fiber favors the accumulation of the offensive "substances of dislike," with all their evil consequences.

Even with healthy persons, cotton and linen clothing, after long wearing, takes a distinctively repulsive odor, while woolen clothing, even in summer, when evaporation is strong, takes only the sour smell of perspiration, and never accumulates other offensive smells. This seemingly unimportant fact, the mention of which may be ridiculed by many, is, nevertheless, of the greatest value to medical science, and has proved of the highest importance for the "resistibility of the human body against contagious diseases."

Thus far Dr. E. Schlegel. The full responsibility of this report of the hypothesis of odorous substances we have to leave to the editor of the "Homeopathic Monthly," in Stuttgart, and its learned contributor, but we believe that the facts are very interesting and of great value, as they are based upon exact scientific investigation. Especially deserve to be mentioned the several thousand experiments regarding odorous substances which have been made with the "chronoscope," an instrument by which the celerity of nervous conduction is recorded.

ENGINEERING INVENTIONS.

Mr. Joseph W. Putnam, of New Orleans, La., has patented an improvement in the class of pile drivers in which the hammer guides or leaders are hinged to permit their inclination, for the purpose of driving piles at various angles.

Messrs. Martin E. Morningstar and John W. Roberts, of Arkona, Ontario, Canada, have patented an improved car coupling of the class called self-couplers; and the improvement consists in the peculiar construction of the link holder.

Mr. Peter Josserand, of Hockley, Texas, has patented an improved valve gear for engines, which consists of a lever, a shaft, and two friction wheels of different diameters for receiving motion from the crank shaft and transferring the motion at an increased velocity to the valve shaft.

Mr. Hans Knudson, of De Forest, Wis., has patented a dynamometrical engine governor, by means of which the work performed by the engine and the strain upon the driving wheel regulates and controls the steam supply.

Mr. Tiry S. Pylant, of Ridge Spring, S. C., has patented improvements in turbine water wheels of that form in which a horizontal wheel is inclosed by a case having upon the top oppositely opening trunks or conduits for delivering the water to the wheel, which trunks have flaring mouths and taper downwardly into the plane of the wheel.

An improvement in well boring apparatus has been patented by Mr. Harry Samuel Gail, of Waukegan, Ill. The object of the invention is to provide means for holding the auger to the rotary shaft in such a manner that they may be easily disconnected to allow of the withdrawal of the auger without disturbing the shaft.

Mineral Veins.—How they were Filled.

We have examples that seem to settle the question in favor of chemical precipitation from ascending hot water and steam. In the Steamboat Springs of Western Nevada, for example, we in fact catch mineral veins in the process of formation. These springs issue from extensive fissures which have been or are filling with silicious veinstone that carries, according to M. Laur, oxide of iron, oxide of manganese, sulphide of iron, sulphide of copper, and metallic gold, and exhibits the banded structure so frequently observed in mineral veins.

In regard to the precise chemical reactions which take place in the deposition of ores in veins, there is much yet to be learned, and this constitutes an interesting subject for original investigation, which I earnestly commend to those who are so situated that they can pursue it.

It may be noticed, however, that the thermal springs which are now forming deposits like those in fissure-veins, contain alkaline carbonates and sulphides, and we have every reason to believe that highly carbonate alkaline waters containing sulphureted hydrogen under varying conditions of temperature and pressure are capable of taking into solution and depositing all the metals and minerals with which we meet in mineral veins.

To these necessarily brief notes on the filling of mineral veins should be added some interesting examples of the mechanical filling of fissures which have been recently brought to light in Western mining. These are furnished by the remarkable deposits of gold and silver ore in the Bassick and Bull Domingo, near Rosita, Colorado, and the carbonate mine at Frisco, Utah. All these are apparently true fissure-veins, filled to as great a depth as they have yet been penetrated, by well rounded pebbles and bowlders which have fallen or been washed in from above. The porous mass thus formed has been subsequently saturated with a hot ascending mineral solution, which has cemented the pebbles and bowlders together into a conglomerate ore. In the Bassick this ore consists of rich telluride of silver and gold, free gold, and the argentiferous sulphides of lead, zinc, copper, and iron. In the Bull Domingo and Carbonate mines the cementing matter is argentiferous galena. That the pebbles and bowlders have come from above is distinctly shown by the variety in their composition and the organic matters associated with them. In the Bull Domingo and the Bassick the pebbles consist of various kinds of igneous rock, mingled with which in the latter are masses of silicified wood and charcoal; while in the Carbonate mine the pebbles are mainly trachyte; but with these are others of limestone and quartzite.

Fossils and other foreign bodies have before this been found in mineral veins, and Von Cotta mentions the occurrence of quartz pebbles extending to the depth of 155 fathoms in the Grüner Lode at Schemnitz, Saxony; but no conglomerate veins like those mentioned above are known to exist elsewhere, and they constitute another of the many new forms of ore deposit which the exploration of the rich and varied mineral resources of the United States has brought to light.

In regard to the ultimate source of the metallic matters which give value to our ore deposits but little can be said with certainty. The oldest rocks of which we have any knowledge, the Laurentian, contain gold and copper, which are indigenous, hence as old as the rocks that contain them, and have been simply concentrated and made conspicuous in the process of their metamorphism. These rocks are all sediments and the ruins of pre-existing continents. By their erosion they have in turn furnished gold, copper, iron, etc., to later sediments by mechanical dispersion and chemical solution. We now find gold everywhere in the drift from the Canadian Highlands, and we have every reason to believe that all the sedimentary strata more recent than the Laurentian have acquired a slight impregnation of several metals from them in addition to what they have obtained from other sources, and we may conclude that the distribution of many of the metals is almost universal. Sea water has been proved to contain gold, silver, copper, lead, zinc, cobalt, nickel, iron, manganese, and arsenic; and there is little doubt that all the other metals would be found there if the search were sufficiently thorough. Hence, sedimentary rocks of every age must have received from the ocean in which they were deposited some portion of all the metals, and for the formation of metalliferous deposits some method of concentrating these would alone be required. A pretty theory to explain such concentration through the agency of marine plants and animals has been suggested by some German mineralogists, and amplified by Professors Pumpelly and T. S. Hunt. Plants have been credited with the most active agency in this concentration; but evidence is still wanting that either plants or animals have played any important part in the formation of our mineral deposits. The remains of sea weeds are found in the greatest abundance in a number of our Palæozoic rocks, and it is almost certain that the carbonaceous ingredient in our great beds of bituminous shale has been derived from this source; yet we find there no unusual concentration of metallic matter, and none of the precious metals has ever been detected in them.

The metallic solutions which have formed our ore deposits have been ascribed to two sources. One theory supposes that they have drained highly metalliferous zones deep in the interior of the earth; the other, that they have leached diffused metals from rocks of different kinds comparatively near the surface. The latter view is the one that commends itself to the judgment of the writer. However probable such a thing might seem, no evidence of the existence of distinct metallic or metalliferous zones in the interior of the earth has been gathered. On the contrary, volcanic emissions, which may be supposed to draw from a lower level than water could reach, are not specially rich in metallic matters, and the thermal waters which have by their deposit filled our mineral veins must have derived their metallic salts from a zone not many thousand feet from the surface. The mineral springs, which are now doing a similar work, are but part of a round of circulation of surface water, which, falling from the clouds, penetrates the earth to a point where the temperature is such as to drive it back in steam. This, with fluid water under pressure and highly heated, possessing great solvent power, may be forced through vast beds of rock, and these be effectually leached by the process. Should such rocks contain the minutest imaginary quantity of the metals these must inevitably be taken into solution, and thus flow toward or to the surface, to be deposited when, by diminished temperature and pressure, the solvent power of the menstruum is diminished. It is evident from these facts that we cannot trace the history of the metals back beyond the Laurentian age. And since we find them diffused in greater or less quantity through the sedimentary rocks of all ages, and also find processes in action which are removing and redepositing them in the form of the ore deposits we mine, it is not necessary to look further than this for a sufficient theory of their formation.—*Prof. J. S. Newberry.*

Steam Cable Towing in Erie Canal.

The Belgian cable towing system, as applied to several sections of Erie Canal, is giving strong evidence of success in arousing the strenuous opposition of those who are interested in the maintenance of the old system of towing. At a meeting of opposition boat owners and boatmen in Buffalo, August 3, it was resolved:

"That the New York steam cable towing system, as being operated on the Erie Canal, does greatly interfere with other ways and modes of towing boats on said route, and therefore it has forfeited its charter; that it is dangerous to boat property interests by reason of collision and delays, and is wholly impracticable. It is not a mode of rapid transit; it is not a cheap and economical method; it is not an improvement over other ways of towing; it is not necessary and it is not wanted in the canal, in consequence of which we unite in asking the Superintendent of Public Works to cause the New York steam cable towing system to be removed for obstructing navigation on the Erie Canal."

THE FASTEST TROTTING.—At Rochester, August 10, the fastest two-mile heat on record was trotted by the horse Steve Maxwell in 4 min. 48½ sec. Flora Temple's previously unequaled record was 4 min. 50½ sec.