Process of Obtaining Printing Surfaces.

The following is a process by Mr. W. B. Woodbury, of London:

When it is desired to prepare a cast of ordinary type or engraved blocks a mould is taken in any of the usual materials—plaster of Paris or paper. Into this mould is pressed a thin sheet of tin foil, lead, or other sufficiently ductile metal, the back of which—that is, the depressed surface—is filled up with a solution of gelatinous material which will set sufficiently hard. The compound sheet of tin foil and gelatine thus formed is then removed from the mould, and its metallic face may be used as a surface to be printed from in the usual way, being either laid flat upon the bed of an ordinary printing press, or being bent or curved round the surface of the cylinder of a suitable printing machine. The method above described may be used to reproduce printing surfaces from blocks or plates of wood, metal, or other material having engraved or other designs upon them, as well as from ordinary type; and sometimes, where the subject of the design to be reproduced is of suitable character, and moisture is not present in the printing ink or during the operation of printing, gelatine or gelatinous material may be poured directly into the cast or mould, without the intervention of tin or other metal foil, and the gelatine surface so obtained may itself be used when dry as a printing surface without the intervention of the metallic face. The gelatine or gelatinous material may be hardened and rendered more impervious to water by the addition of a small quantity of chrome or other alum, or other substance capable of hardening gelatine and rendering it insoluble.

The surface of the tin foil which forms the printing surface, or of the gelatine, is preferably electroplated with a deposit of nickel, steel, or other hard metal for the purpose of rendering it more durable, and such deposit may be effected upon the surface of the sheet either before it is applied to and pressed into the cast or mould, as described, or after the compound printing surface has been completed. In cases where it is desired that the printing surface to be produced shall be more or less soft or flexible, so that it may be used as a hand or other printing stamp, gelatine or gelatinous material, to which has been added a sufficient quantity of glycerine or other substance, such as sugar, capable of rendering the mixture sufficiently soft, flexible, and elastic when dry, is used as a back to the tin foil.

The process may be applied to the reproduction of designs or pictures obtained by means of photography in the following manner: Upon a plate of glass a gelatinous printing surface of any desired design or picture is prepared by means of light in the ordinary well known way. Upon the printing surface so prepared a sheet of tinfoil, preferably electroplated with a harder metal, is placed, and being covered with a number of thicknesses of blotting paper, is passed through an ordinary rolling press, until the metal foil is pressed into intimate contact with every part of the gelatine printing surface, every detail of the design upon which is thus reproduced upon the back of the metal. The surface so prepared and covered with the tin or other metal foil may be used for printing from in an ordinary printing press; or where the subject requires it, as, for instance, where half-tones are to be produced, pictures or impressions may be obtained by means of gelatinous ink, more or less transparent, applied to the printing surface, and thence transferred to paper placed upon it, either by means of a flat plate of glass or other material pressed down by any suitable press or by weights. When it is necessary that the design of the pictures produced should not be reversed Mr. Woodbury uses a white pigment, which he transfers to black or colored paper, or a positive instead of a negative photographic picture in order to obtain the gelatine printing surface. In the methods above described, in order to make the tin foil adhere to the gelatine when it is pressed against and into the design, the surface of the gelatine is covered with a thin solution of India-rubber in benzole. The tin or other foil pressed upon it adheres perfectly when dry.

A Chemical Anomaly.

M. Schützenberger has recently made a communication to the Chemical Society of Paris, which, if confirmed, will have an important bearing upon the fundamental principles of chemical science. While pursuing his researches on the petroleums of the Caucasus, the author has not been satisfied with the results of his analyses, which, though made with the greatest care, frequently showed more than 100 per cent of matter. It is known that the ultimate analysis of such bodies is effected by burning a weight, P, of the substance in pure dry oxygen, and by weighing the quantities of water and carbonic acid which alone are formed in the combustion. The weights p of hydrogen and p' of carbon are deduced from the quantities of water and carbonic acid found, and we ought to have $p+p'=P$.

For this calculation to be correct it is not necessary that the composition of water and of carbonic acid must be absolutely exact and constant; H_2O must contain precisely 16 parts of oxygen to 2 of hydrogen, and CO_2 must consist of 32 parts of oxygen to 12 of carbon. The best analysts of all countries have demonstrated that such is the fact. In the case of M. Schützenberger's analysis the weights p and p' of hydrogen and carbon, calculated for the formulæ H_2O and CO_2, are greater than P; and he finds $p+p'=P+m$, without being able to find any change in the nature and purity of the products weighed.

As the Caucasian petroleums have been but recently studied, M. Schützenberger considered it necessary to verify the facts with other products. Pure aniline and benzol showed the same anomalies, yet there can be no doubt as to the composition of bodies which have been for years so completely studied; 100 parts of benzol, C_6H_6, have given quantities of water and carbonic acid such that the sum of the weights of carbon and hydrogen present is = 101 to 101·5. All causes of error inherent in such analyses have been examined and discussed, and more than 150 experiments made.

The author has sought to prepare pure substances which should give 100 per cent, and others giving 101 per cent. In so doing he has made the curious observation that if Caucasian petroleum, aniline, and benzol are heated with sodium or copper, and distilled, they acquire the property of giving more than 100 per cent on analysis, and retain it for a long time if kept in the dark. An exposure of two hours to the light was sufficient to cause a sample which had previously given 100 to 101·5, in a series of determinations, to show no more than 100 per cent. Thus sodium and copper would have the curious property of modifying certain substances without changing their apparent properties. The fact of the possibility of causing compounds to yield more than 100 per cent by the action of sodium, and restoring them to the normal state by the action of light, eliminates all errors due to weighings and manipulations; such errors would appear promiscuously in bodies whether modified by sodium or not. M. Schützenberger, without proposing any formal theory, suggests that the composition of water and of carbonic acid is not always what is supposed. It may also be that the weight of atoms varies within certain narrow limits.

If what we call an atom is merely the result of a vibratory movement of matter according to a certain law, this vibratory movement of the hydrocarbons may possibly be modified by that of sodium or by the luminous vibration.—*Revue Scientifiques and Les Mondes.*

The Mean Velocity of Streams.

At a recent meeting of the American Society of Civil Engineers, a paper by Mr. R. E. McMath, of St. Louis, on the above subject, was read, and with it was presented a set of diagrams of curves, deduced from the experiments of J. B. Francis, at Lowell, from the observations of Gen. Theo. G. Ellis, upon the flow of the Connecticut River, from the records of the flow of the Mississippi, made by Generals Humphreys and Abbot, and also from various other observations of the flow of the Mississippi, at Columbus, Ky., at Vicksburg, Miss., at Carrollton, La., and at the passes at the mouth of the Mississippi.

The author of the paper presents for consideration and discussion the suggestion that, to determine a reliable rule for the flow of streams in natural channels, the considerations affecting an artificial channel should be kept entirely distinct; that the definite law of discharge over a river is usefully applicable at any transverse section above and within the influence of a river, dam, or shoal; that the relation between mean and maximum velocity cannot be used in streams of irregular section; that head is pressure, but not in all cases full of surface; that in natural streams the bars or shoals are substituted for the weir or dam; that the level of no discharge is determined by the horizontal plane through the crest of a weir, dam, or natural bar; that two new hydraulic terms may be used, namely: permanent area, or that part of transverse section below the plane of no discharge; and ruling depth, or the depth of the plane below the surface. Formulæ are then suggested in application of these considerations.

Velocity of Propagation of Explosive Phenomena.

The question as to how quickly explosive phenomena in gases travel has now been fully studied by MM. Berthelot and Vieille, and the results are of a somewhat unexpected nature. The authors operated chiefly with an explosive mixture of hydrogen and oxygen at atmospheric pressure. A straight horizontal lead tube, about 133 feet long and one-fifth inch interior diameter, was filled with the mixture, and the explosion started by means of an electric spark at one end. The flame, as it went along, ruptured two electric circuits, by acting each time on a grain of fulminate of mercury applied to a thin strip of tin. Thus a delicate chronograph was affected (the Le Boulenge, having a precision equal to one twenty-thousandth of a second). When the tube, instead of being placed straight, was arranged in several parallel pieces with bent joints, the velocity seemed to be the same. The general average for both cases was 2,841 meters, or about 9,470 feet, per second. A doubt, on getting this high figure, whether it was really the rate of propagation of the detonation that was being measured, or whether a vibratory motion of the metal might not have been the cause of rupture of the circuits (though this seemed unlikely), was set at rest when the similar strong caoutchouc tube was found to give like figures. With a capillary glass tube the velocity was somewhat less, viz., 2,341 meters. Next, it was found that the velocity was much the same, whether one or other of the ends was open alone, or both were open, or neither. The velocity appeared to be uniform throughout the tube, and with pressure varied between one and three, the velocity seemed independent of pressure. Once more the velocity is different in different gases; thus, in a mixture of carbonic oxide and oxygen, it was found to be 1,089 meters, and dilution of the other explosive mixture, of hydrogen and oxygen, with air, reduced the velocity. For instance, in a mixture containing 45 per cent of the explosive gas the velocity was 1,439 meters.

AGRICULTURAL INVENTIONS.

Mr. Asa Chandler Hinson, of Pidcock Ranch, Texas, has patented an improved stock and suitable devices for connecting a plow to any pair of wheels and axle forming a part of a wagon. By these simple additional connections a farmer may construct a sulky plow in a cheaper and simpler manner.

Mr. Jacob S. Baker, of New Freedom, Pa., has patented an improvement in fertilizer attachments for grain drills, which consists in certain means for operating the valve that controls the discharge from the hopper.

An improved coupling for sulky plows has been patented by Mr. Michael Kite, of Prairie Township, Jackson County, Mo. The object of this invention is to allow a sulky plow to be turned at the corner of a "land" without raising the plow from the ground, and also to prevent side draught upon the sulky tongue. The invention consists in a double hinge coupling for sulky plows, constructed with a U shaped bar and a bolt for clamping the plow beam, and the three bent bars hinged to the clamp bolt and to the draw bail of the sulky, whereby the plow beam will have a free lateral and vertical play.

Mechanical Excitation of the Optic Nerve.

It is commonly believed that, like most other nerves, the optic is sensitive to mechanical stimulation, that thus sensations of light may be excited, just as they are by a similar stimulation of the retinal elements. The question has been recently re-examined by Schmidt-Rimpler, who comes to the conclusion that the current opinion is true, although the grounds on which it is based are not altogether correct. It is usually asserted that division of the nerve in enucleation of the eyeball causes a sensation of light. The fact is, however, doubtful. Rothmund, of Munich, has several times extirpated an eyeball without anæsthetics, and has never known the division of the nerve to cause a sensation of light. It is probable, however, that in many such cases the fibers of the nerve are totally degenerated. A more conclusive instance has been met with by Schmidt-Rimpler. A large part of the contents of one orbit had to be removed on account of epithelioma. The eyeball was healthy, and vision with it considerable, but it could not be saved. The patient was perfectly conscious when the nerve was divided, and was asked if he experienced any sensation of light, but replied in the negative. It is suggested that the supposed stimulation of the nerve on division was really a stimulation of the retina in consequence of the tension of the globe by its necessary fixation at the moment of division of the nerve. Another fact which has been advanced as proof that the optic nerve is sensitive to mechanical stimulation, is the sensation of light which may be produced by extreme lateral movements of the eyeball. It has been referred to the stretching of some of the fibers of the optic nerve. But Schmidt-Rimpler points out that the sensation thus produced is that of a circle of light with a dark center, and that its apparent position corresponds nearly to the point of entrance of the optic nerve. It is difficult to conceive that the fibers which end near the disk have a course so separate from others that they are only stimulated when the nerve is stretched. It is more probable that the phenomenon is due to extension of the sheath of the optic nerve, which pulls upon the sclerotic around the entrance of the optic nerve, and so stimulates the retinal elements. The absence of reaction on division of the nerve does not, however, exclude altogether its mechanical sensibility, since other nerves, motor and sensory, which certainly possess this sensibility, may not react if quickly divided. That sensations of light may be produced by mechanical irritation of the nerve is shown by some observations made by Schmidt-Rimpler on persons from whom an eye had been removed not long before. A blunt instrument was pressed against that part of the orbit in which the stump of the nerve was situated. The observations were made in a room almost completely dark. Of six persons, in two pressure on this spot always caused a flash of light on the side of the enucleated eye. One of them averred that the sensation exactly resembled that which he had before experienced when the eyeball was galvanized. The same patients experienced a similar sensation when the stump of the nerve was galvanized. The negative result in other cases may be explained by more complete atrophy of the nerve, or greater retraction of the stump. These positive observations seem to establish conclusively the mechanical excitability of the optic nerve. —*Lancet.*

Prizes for Farmers' Boys.

The prizes won by Vermont boys last year in competition for the awards offered by the University of Vermont and State Agricultural College, through the generosity of ex-Gov. Smith, have been declared. The conditions of the trial were the same as those of the former trial in 1880, and show a substantial advance, the first prize winners obtaining 5 bushels more of corn and 60 bushels more of potatoes to the acre than the best of the former year's figures. Twenty-five young farmers obtained yields of over 80 bushels of corn and over 250 bushels of potatoes to the acre, and the yields range from these figures up to the really remarkable ones of 127 bushels of corn and 552 bushels of potatoes to the acre! The latter result, at the prices obtained for potatoes last fall, would represent a return of over $300 per acre. The first prize on corn was won by Thomas B. Purdy, of Manchester; the first on potatoes, by Frank C. Ayer, of Goshen.

Public Works in New York City.

The annual report of the Commissioner of Public Works shows that the department was conducted during the past year for much less than half the expenditure of 1871, notwithstanding the large increase in area and population. The amount disbursed was $3,654,523. The drought of last year and the near approach to a water famine naturally led to plans for increasing the water supply of the city. That of the Chief Engineer of the Croton Aqueduct is to construct a dam across the Croton near its mouth, thus embracing the entire discharge of the watershed and adding about twenty-three square miles to the existing drainage area. The reservoir or lake formed by this dam would cover an area of over 3,600 acres, and would contain available storage to the amount of about 32,000,000,000 gallons, sufficient to supply the conduit with 200,000,000 gallons a day for 160 days, without recourse to the flow of the Croton. From this reservoir an aqueduct, mainly in rock tunnel, would be run to the Harlem River, and thence to the Central Park reservoir. With the aid of Mr. E. S. Chesbrough, consulting engineer, this plan has been worked out. The estimate made early in the season for constructing this work on the basis of a conduit of 150,000,000 gallons daily delivery was $12,000,000. Subsequent investigation has shown that the work could be executed within that estimate. The plan now proposed, however, contemplates an aqueduct of about 250,000,000 gallons daily capacity, and the estimate for the construction is $14,000,000.

Alluding to the subject of preventing waste of water the report says that during the year, 1,291 additional water meters were placed, making a total of 5,293 in use at the close of the year, distributed as follows:

	No. of Meters.	Gallons of Water Used per Day.
Hotels	327	1,444,900
Breweries, malthouses, etc.	269	1,187,200
Charitable institutions	85	417,000
Offices	1,542	1,395,500
Factories	234	851,400
Gas works	32	713,700
Railroads	169	1,131,100
Stables	1,238	969,500
Apartment houses	54	188,700
Docks	100	1,354,000
Miscellaneous	1,243	2,272,400
Totals	5,293	11,925,400

Nine and one-tenth miles of pipe were laid to extend the distribution of Croton water, and 449 fire hydrants were placed during the year. The distributing system now comprises 512 miles of pipes, with 5,427 stop-cocks and 6,496 fire hydrants. The general disposition to use water in a lavish or wasteful manner is shown by the large consumption in the high-service districts. During the year 4,236,000,000 gallons of water were pumped and distributed from the high-service works, being 11,600,000 gallons per day, supplying 7,492 dwellings, 444 factories, 83 stables, and 588 schools, churches, asylums, and other institutions. This is an average of 1,347 gallons per day for each building, and an average of 100 gallons daily per capita. At this rate the consumption for the entire city would be at least 125,000,000 gallons per day, while the actual supply which the aqueduct is capable of delivering is a little over 95,000,000 gallons per day.

At the close of the year there were 23,521 public lamps in use in the streets, avenues, public parks and places of the city, including 55 electric lights on Fifth avenue, Broadway, Thirty-fourth street, Fourteenth street, Union square, and Madison square. Seventeen million one hundred and sixty-nine thousand six hundred cubic feet of gas was used in public buildings, offices, markets, and armories under the charge of the department. The eight public baths which were open from June 1 to September 30 were used by 2,381,209 males and 1,117,323 females. An additional bath will be ready for use next season.

During the year 33,131 lineal feet or 6·27 miles of sewers, 487 lineal feet of culverts, and 21 receiving basins were built, making the present extent of the sewerage system on Manhattan Island 387·07 miles, with 4,595 receiving basins. The entire expense for caring for these sewers was $115,979 77.

The two most important works completed during the past year are the large collective sewer on West street, from Spring street to West Eleventh street (very nearly finished), and the deep sewer on Fifth avenue, between Fifty-fifth and Fifty-ninth streets.

The area of new pavements laid during the year is put down as 324,950 square yards, covering 15·7 miles of streets—an increase of 80,143 square yards over the amount of pavements laid in 1880. The present extent of paved streets on Manhattan Island is 340½ miles, of which 70½ miles are cobblestone, 244 miles granite and trap block, 25½ Macadam, and one-half mile asphalt. The aggregate length of streets regulated and graded during the year is given as 2½ miles.

A large part of the report deals with the difficulties encountered in the maintenance of the pavements. These all arise from the number of underground structures in the streets, the full extent of these structures being 1,789·58 miles, divided as follows: Sewers, 383 miles; water mains, 512 miles; gas pipes, 885 miles; steam pipes, 1 mile; pneumatic tubes, three-quarters mile; telegraph tubes, 1⅓ miles; and electric light wires, 7 miles. The following permits for laying pipes have been granted in pursuance of action of the Common Council: The Edison Company, 10·8 miles; United States Heating and Power Company, 5·6 miles; New York Steam Company, 1·5.

Swedish Matches.

During the past year, says a correspondent of the London *Grocer*, one factory alone has exported from Sweden 22,000,000 skalpunds of matches. This was the famous factory at Jönköping, known all over the world by the name of "Jönköping's Tändstickor Fabrik." The factory is one of the prides of the country, for not only is it representative of what is rapidly becoming an important Swedish industry, but the distinctiveness of its products has given it a certain international importance.

Its origin dates from the year 1845, when a well-known chemist, named J. E. Lundström, started a small manufactory in Jönköping for the production of the ordinary phosphorus matches then in use. The undertaking was a successful one, and Lundström was enabled to devote his leisure to inquiries and experiments having for their object the improvement of matches. The great question at that time agitating the scientific world was how to make matches safe in their use, not only as far as their explosiveness was concerned, but also in connection with the poisonous properties of the ordinary or white phosphorus which was the principal ingredient in these primitive matches. In 1846 the Austrian chemist Preshel produced a new kind of match, which, by reducing the quantity of chlorate of potash in its composition, he rendered no longer detonating. The poisonous exhalation, however, yet remained. In 1847 Dr. Schrötter, Secretary to the Imperial Academy at Vienna, pointed out in the course of a chemical work, that Emile Kopp, of Strasburg, had three years previously discovered the red or amorphous phosphorus, and asked whether so innocuous a substance might not advantageously be substituted for white phosphorus. The suggestion was lost to the world for a time. Some years afterward, however, the work of Schrötter fell into the hands of Lundström; and the latter was so struck with the feasibility of this theory that he immediately set about attempting to realize it. In 1853 his experiments were crowned with success. He manufactured matches with red phosphorus, which were doubly safe. In the first place they were matches of the kind known as "safety," only lighting on the box; and in the second place, in order to prevent a consumption of phosphorus which might be injurious, the phosphorus was placed, not on the match, but on the friction surface of the box. Thus Lundström matches are "safety" in more ways than one: they have nothing in them of an explosive nature, and both in the factory and in the house of the consumer they are not in the slightest degree calculated to affect health.

As may be imagined, this invention of Lundström gave a great stimulus to the development of his factory. Soon a new and more spacious site was selected for the erection of an establishment on a larger scale, situated north of Lake Wettern, and with easy communication by rail. Since 1857 the factory has been in the hands of a company, composed of 11 shareholders, with a capital of 4,000,000 kronor. The number of hands employed is 872, of whom 533 are men and 339 women. During the past year 202,841,070 matches have been made in this one establishment, the weight being 66,416 centner, and the aggregate value 2,806,744 kronor. Eight steam engines, of about 119 horse power, are employed in the factory, by which 250 different working machines are set in motion. The precautions against fire are so efficiently carried out that the buildings are insured for comparatively low premiums. The Jönköping matches are made out of ash sticks, which are carefully assorted and sawn into blocks of about one foot and a half long. After removing the bark, they are laid for a certain time in water, to render the wood both tougher and more pliable. Subsequently, the blocks are cut by machinery into thin laths from 12 feet to 15 feet long, of the same thickness and width as the breadth and length of the matches. By the next process the laths are packed together in bundles of about 50 in a machine which produces match sticks at the rate of 1,000,000 per hour. They are finally dried by warm air, dipped in the igniting composition, and packed in boxes, which are mostly made by prisoners in the jails of the city of London.

It is worth remarking that the comforts and welfare of the workpeople in the factory are by no means forgotten. Dwelling places, schools, and reading rooms have been erected on the premises for their sole use, and a fund has been established by the shareholders, to which the factory people contribute a small sum, and become thereby entitled to help in case of sickness or infirmity. I may mention that Lundström's formula for the manufacture of his matches consists of a mixture of chlorate of potash, sulphate of antimony, and gum arabic for the matches, and a similar mixture, but with red phosphorus, for the friction surface in place of the chlorate of potash.

Lead.

Lead, symbol Pb, combining weight 207, is usually obtained from an ore called galena, which is a sulphide, by a process of roasting. It is a soft blue metal, easily scratched, even by the nail; it is very malleable, but possesses but little tenacity. Lead melts at about 600° Fah., and passes into a vapor at a white heat. Its specific gravity is 11·4, and it is therefore one of the heaviest of metals. It is but little affected by the atmosphere, as the thin film of oxide which first forms serves to protect the metal from further change. The action of water upon lead is also rather remarkable. Pure waters containing but little saline matter attack lead and dissolve a portion of the metal, while hard waters containing considerable quantities of sulphates and carbonates have no appreciable action on lead, because they form on its surface a deposit which effectually prevents all solvent action.

As all lead compounds are very poisonous, great care should be taken, says the *Brewers' Guardian*, to prevent contamination with this metal, and soft waters should not be allowed to pass through leaden pipes or be stored in lead-lined cisterns. Lead combines with oxygen in several proportions. The protoxide PbO, commonly called litharge, is largely used in several industries, but has no direct interest for brewers. The dioxide PbO_2 is even of less importance, but an intermediate oxide having the composition Pb_3O_4 possesses a fine red color, and is largely used as a pigment, and is known as the red lead of commerce. None of the salts of lead require detailed description. We may, however, just mention a compound of the carbonate and the hydrate known as white lead, which is very extensively used as a pigment, not only for the purity of its color, but also for its great opacity, which quality causes it to be used in combination with other paints when great "body" is required. The great objection to lead compounds as pigments is, that they always blacken on exposure to air, as the atmosphere, especially in the neighborhood of large towns, contains traces of sulphureted hydrogen, and for this reason zinc-white is now largely substituted for white lead.

Tests for Lead.—The characteristic test for lead in solution is the production of a black sulphide on addition of sulphureted hydrogen, this sulphide being insoluble in dilute acids. Hydrochloric acid gives a white precipitate of plumbic chloride in not too dilute solutions, and iodide of potassium gives a very brilliant yellow precipitate of iodide of lead. Sulphuric acid produces a dense white precipitate of plumbic sulphate, which is very insoluble. In the dry state the presence of lead may be detected by the easy reduction of the metal in the form of a malleable bead, when a little of the substance is heated on a piece of charcoal before the blowpipe flame. In testing waters for lead contamination they must first be acidified with a drop or two of hydrochloric acid, and then a little saturated solution of sulphureted hydrogen added, or, what is still better, a current of the gas should be passed through the water, when, if the slightest trace of lead be present, a brownish tinge will be apparent, and if much lead be present a black precipitate of sulphide of lead may even separate.

Michigan Metals.

A comparatively small, narrow part of the State of Michigan, skirted its whole extent on the north by Lake Superior, and on the south, in large part, by Lakes Michigan and Huron, and known as the upper peninsula, in little more than a quarter of a century, has contributed to the realized mineral wealth of the country nearly $300,000,000 in ingot copper, pig iron, and iron ores. Of this immense product, the iron mines have furnished nearly $130,000,000. Last year the copper product was in value about $10,000,000, and the iron about $18,000,000, making a total of $28,000,000, while the promise for 1882, both for copper and iron, is that the product will be greater. A pretty good showing for a strip of wilderness, and there is to-day more iron in sight than ever before, more new mines than old ones, and more iron territory remaining to be opened and explored than has been explored up to this time, three acres to one.—*Mining Record.*

Muriate of Pilocarpine in Whooping Cough.

According to Albrecht, the muriate of pilocarpine, when given at a sufficiently early period, never fails to cut short the most serious stages of whooping cough, namely, the period of suffocative attacks, although the duration of the disease as a whole is not materially shortened thereby. The formula recommended is pilocarpin. muriatic., 0·025 grm.; cognac f. champ., 5 grms.; syrup. cort. aurant., 25 grms.; aq. destill., 70 grms.; of which mixture a teaspoonful up to a tablespoonful should be administered after every paroxysm, the dose varying with the age of the patient. The remedy acts very promptly, as may be demonstrated by laryngoscopic examination, which discloses a more profuse watery secretion and abatement of the inflammatory appearances in the mucous membrane. The drug should be discontinued as soon as the paroxysms attain a catarrhal character, but should be renewed whenever suffocative attacks recur.—*Allgemeine Medicinalzeitung.*

An Item in Cable Work.

The following is taken from the *Times of India*: "During the repairs of the telegraph cable near Bombay, the steamers Chiltern and Great Northern were about half a mile apart, the former having hold of a shore end cable, and so was in telegraphic communication with Bombay; the latter having hold of a sea end, and so was in telegraphic communication with Aden. The Chiltern desired the Great Northern to splice on to the cable end held by the latter, and pay out three-quarters of a mile of cable, and this was communicated by wire from the test room of the Chiltern, passing through all the coils of cable in her hold and on to Bombay, whence it was sent on to Aden, and back from Aden to the Great Northern. Thus, as a speedy means of sending a message half a mile, it was forwarded by a route between three and four thousand miles long. The following morning, when the vessels were within a quarter of a mile of each other, communications passed between them constantly in the same way."