A vast amount of mischief has been done in this way by people who think they have the good of the community at heart. Against their extravagant and often baseless assertions our Boards of Health set overwhelming evidence that the frequency and virulence of small-pox have been greatly mitigated by vaccination wherever it has been systematically practiced. The records of Riverside Hospital, where the small-pox patients of this city are sent, show that the mortality among the unvaccinated is from two to three times as great as among those who claim to have been vaccinated; and it is well known that with a considerable portion of those who have been vaccinated the work has not been well done, or the protection has become diminished by time.

During the epidemic in Philadelphia ten years ago less than a quarter of the deaths among those who had been vaccinated were of those who showed a good typical scar.

Where re-vaccination had been carefully practiced the immunity from the disease seemed almost perfect, and in the few cases in which small-pox was taken by such persons none died. The statistics on this head are instructive. The report of the physician in charge of the hospital for small-pox patients (Dr. Gunn) says:

"Among 2,377 cases of small-pox admitted during the epidemic, only 36 are said to have been re-vaccinated, of which four died. But by subjecting these cases to a careful analysis, we find as follows: Seventeen were re-vaccinated at a distant period, some as far back as thirty-one years; five had not been re-vaccinated until after exposure; seven were said to have been successfully re-vaccinated, but were unable to exhibit any cicatrices as the result; sixteen bore upon their arms very poor and uncharacteristic scars, some of which, indeed, were scarcely visible; five presented fair cicatrices; and only three cases were able to show good cicatrices. Of the four cases which died, two occurred among those without cicatrices, one among those re-vaccinated after exposure, and one among those showing poor and uncharacteristic scars. All the cases which bore upon their arms unmistakable evidence of successful re-vaccination suffered from the mildest form possible of the disease. Indeed, three of these cases exhibited an eruption of doubtful character, and have therefore been recorded as cases of varioloid (?). The eruption on three others did not advance beyond the papular stage; and on seven it was barely vesicular. From the foregoing facts, we are fully prepared to earnestly and cordially recommend re-vaccination as a most necessary supplemental measure to the primary vaccination."

Evidence of this nature is abundant. And the surest way to prevent small-pox epidemics, or the popular alarm which attends threatened epidemics, is to vaccinate and re-vaccinate from time to time until no further "taking" is possible.

THE PETROLEUM BASINS OF WYOMING.

Prof. Samuel Aughey, who has recently examined the Shoshone and Beaver oil basins in the Territory of Wyoming, has just made a report to the owners, and from this we glean the following particulars in regard to these important deposits of petroleum. The Shoshone springs are 78 miles from the Union Pacific Railroad, and immediately north of Point of Rocks station. The extent of the basin is about forty acres. In past ages a lake of petroleum covered the entire basin, a fact which is now evidenced by a remaining covering of hardened oil. Within the basin there are now hundreds of points from which gas and oil are continually issuing. The land, claimed and held by a stock company, aggregates 400 acres, embracing all the old oil basin, and title has been secured under the United States mining laws. This company has sunk a number of shafts, which are now used only for the storing of oil. Prof. Aughey computes the amount at present collected and held ready for shipment to be about 1,500 barrels, but there are as yet no facilities for transportation to the railroad. He believes that the ultimate capacity and extension for production of this oil basin is very great, and that the quantity of oil stored away in these Wyoming reservoirs is greater than in more eastern localities. The oil is intensely black, the coloring matter being inseparable by any method or process as yet tried. Distillation of a small quantity gave 0.63 naphtha. There was 47 per cent of a kerosene, having 150° flash test. It then produced 32 per cent of a neutral and lighter colored lubricating oil, with 12 per cent of dry coke. The oil as it flows has a gravity of 20°. Its flash test is 294° and fire test 322°. Cold test 16° below zero. The Beaver oil basin is situated 25 miles directly east from the Shoshone, and in every respect seems separate and distinct from the latter. The oil which issues here is of a much lighter color than at the Shoshone deposits, varying from a pale yellow to a light mahogany. It has a gravity of less than 20°, and, as far as tried, has proved an extraordinary lubricant, with an excellent cold and fire test. Its odor is no more unpleasant than that of lard oil. Included and connected with these oil basins there exists a magazine of fuel, which for extent and value is extremely important. A very slight alteration in furnaces will admit of this hardened hydrocarbon as a fuel for general use. Even now, and surrounded by such vast deposits of lignites, it does not seem to be any too soon to call attention to a combustible of ten times the potency of coal for generating steam. It has, moreover, in its favor a saving of labor and expense in mining, and an advantage of 90 per cent of weight. There are millions of tons of this hardened oil near the surface in these two basins. Russia is already utilizing *her* hardened oils of the Caspian Sea in operating her railroads, and it is safe to say that the railway which crosses Wyoming Territory will not remain long unmindful of the rich and cheap deposit of fuel which lies so close at hand.

EXPERIMENTS WITH UNDERGROUND WIRES.

After a three months' test of their system of insulating telegraph and telephone wires underground, the national Subterranean Electric Company have applied for permission to introduce their system in Philadelphia. The company claim that when once introduced on their plan, telegraph, telephone, or other wires can be used in separate chambers, and that no disturbance of the pavement will be required for repairs or for additional wires. In the experiment referred to, in Camden, the telephone wires were, after three months' use apparently in as perfect condition as when first laid down. The plan embraces a system of terra-cotta cylindrical blocks, perforated lengthwise with several small holes, vitrified and lined with rubber. These blocks are laid end to end, cemented together, and form groups of pipes through which wires or cables are run. These pipes are laid in sections, at the end of each a sunken chamber affording workmen access to the pipes and wires for purposes of repairs or laying additional wires, which can be strung through the sections from chamber to chamber. The chambers are covered when not in use, and afford no obstruction to travel. The cost of the system is not given.

What is claimed as a cheap and durable system is under trial in Prospect Park, Brooklyn. The wires are strung in a trough of pine wood, into which is poured a mixture of pulverized glass, resin, and other ingredients made semi fluid by heat. In this compound, which becomes hard on cooling, the wires are hermetically sealed. It is claimed that the mixture has a very high insulating power, is durable, and sufficiently elastic to maintain its integrity under varying pressure. A bundle of wires of any length can thus be laid in sections without a break, and operated with a relatively small battery power, owing to the perfection of the insulation. The cost of the system is given at $1,500 a mile. The number of wires and the space between them are not given.

A more expensive and not altogether satisfactory system is used in London, where something like a hundred miles of underground lines have been laid. In this system the iron or earthen piping is in sections of 200 yards, separated by test and joint boxes. The cables are composed of 60 No. 18 copper wires insulated with gutta percha. The cost is given at about $7,000 a mile. The maintenance of perfect insulation is difficult, and when a fault occurs the whole cable has to be withdrawn and repaired.

A TELEPHONIC CONTROVERSY SETTLED.

An interesting controversy as to priority of invention has been going on before the Patent Office for the past two years between Alexander Graham Bell, the telephone inventor, and David Brooks, of Philadelphia, the well-known electrician. The invention in dispute was the use of a return wire on a telephone circuit, to prevent the noises of induction. On some of the city telephone lines the noise produced by induction from electrical currents is so great as to form a serious obstacle to the use of telephone instruments. If one attempts to listen there is such a loud bubbling noise heard, and such a mixture of clicks and other voices, which come in from the neighboring wires, that the principal satisfaction of conversing with one's correspondent is taken away. If the telephone wire passes in the vicinity of Western Union wires, on which Gray's harmonic telegraph instruments happen to be at work, then there is added to the general confusion of tongues a series of tootings or cat calls that are quite distressing to the ears of sensitive telephoners. Professor Bell and Professor Brooks discovered the remedy; it consists in using two wires on the telephone circuit instead of a single wire. If an extra wire, insulated, is stretched close alongside of the usual single wire, the extra being employed as a return circuit wire, instead of the earth, then all noise from induction disappears, and telephoning becomes a pleasure.

The Commissioner of Patents decides that the priority of invention belongs to Prof. Brooks, he having made the invention in July, 1877, whereas Bell did not make it until the end of August, 1877. But, more than this, Bell's date of invention must, by law, be carried forward to the date of the final enrollment of his English patent, May 18, 1878; as it is not allowable, in this country, so far as proofs of invention are concerned, for any applicant, if he takes a foreign patent before he applies for an American patent, to go back of the date of his foreign patent. Bell did not apply for his American patent until December 20, 1878. The Commissioner of Patents, therefore, reversed the decision of the Board of Examiners in Chief, and awards the discovery to Professor Brooks, to whom it clearly belongs.

Gilding Steel.

Polished steel may be beautifully gilded by means of the ethereal solution of gold. Dissolve pure gold in aqua regi, evaporate gently to dryness, so as to drive off the superfluous acid, re-dissolve in water, and add three times its bulk of sulphuric ether. Allow to stand for twenty-four hours in a stoppered bottle, and the ethereal solution of gold will float at top. Polished steel dipped in this is at once beautifully gilded, and by tracing patterns on the surface of the metal with any kind of varnish, beautiful devices in plain metal and gilt will be produced. For other metals the electro process is best.

Effect of a Galvanic Current upon the Absolute Strength of Iron Wire.

Some experiments made by G. Hoffmann to determine this point have recently been made public, and will perhaps surprise many of our readers, some of whom will expect to find that electricity has no effect upon strength, while others will be disappointed to find this influence so slight. The wires employed were very small, ranging from one-fifth to two-fifths of a millimeter in diameter. (One line is about equal to two millimeters.) A piece of each wire, one meter long, was clamped at both ends between steel plates, and thus suspended at one end while a scale pan hung from the other end, and in it were placed, at first, weights, then fine sand was poured in until the wire broke under the strain. The experiments were conducted between 68° and 77° Fah., and mostly after the passage of a current, a few, however, during its passage. Feeble currents were employed, and those as constant as possible, and with every practicable precaution. The duration of the separate experiments was almost always the same.

In every case there was an increase of strength, and when the passage of the current lasted three hours the weight requisite to break the wire was increased from twelve to ninety-two grains.

With increased time there was an increase of strength up to a certain maximum, which was attained in some wires sooner than in others. Thus wires which gained in three hours 12 to 28 grms., gained in twelve hours 23 to 44 grms., and in 25 hours 24 to 50.

With feeble currents the increase of strength for equal times was nearly proportional to the strength of the current. If the current was somewhat stronger this law did not hold any longer, owing to its heating the wire The strength seemed to be greater while the current was passing than after it was broken.

Hoffmann thinks that while this increase of cohesive power was partially due to the heat generated by the current, the galvanic current itself played its own essential part therein. A. P.

Constipation.

Hall's Journal of Health thinks it is doubtful if consumption numbers as many victims as are stricken down by the various diseases that result from habitual constipation. True consumption is an inherited disease. It may remain always dormant, but when aroused to action, decay commences at a point circumscribed, and gradually extends—unless arrested—until so much of the lungs becomes involved that vital action ceases. The evils of constipation result from inattention to the calls of nature, and usually commence with children whose habits are not closely looked to by their parents.

The processes of nature are always active while life lasts. When effete matter is retained a moment beyond the time its expulsion is demanded, the system commences its efforts to get rid of it. When the natural egress is checked, the absorbents carry the more fluid portions of the poisonous mass into the circulation, and it becomes diffused throughout the body. The more solid or clay-like portions is forced into the lower rectum, where it becomes firmly impacted, thus cutting off the circulation in the small blood vessels, causing painful engorgements known as piles and hemorrhoids. A continuance of these troubles often results in fissure, fistula, or cancer. The trouble is seldom confined here. As a result of the blood poisoning we almost invariably find more or less dyspepsia, with decided derangement of the functions of the heart, liver, and kidneys, accompanied by headache and nervous debility, often verging on paralysis.

Coal Ashes for Fertilizing.

The use of coal ashes mixed into clayey soils has been found of great benefit, and its value is vouched for by many agriculturists. The *Husbandman* reports an experiment made with coal ashes, applied at the rate of 200 bushels to twenty square rods, or ten bushels to the square rod. The soil was compact and heavy. The ashes were drawn on late in the autumn and spread on the ground, which had been recently plowed. In the spring the plowing was repeated, thoroughly mixing the ashes with the soil. The ground was planted with garden vegetables. The beneficial result was in the correction of the heavy character of the soil, the ashes acting mechanically and not as a manure, and producing a satisfactory improvement.

Newspaper Telegraphs.

The desirability of having immediate and absolute control of telegraphic facilities in certain emergencies has led to the leasing of telegraph wires by newspapers. The London *Times* has some short ones; the New York *Tribune* has a wire between New York and Washington; the leading papers of Cincinnati are similarly connected with Washington; and recently the Chicago *Inter-Ocean* has taken what is probably the longest wire leased by any newspaper, connecting its editorial rooms with its news bureau in Washington. All messages are sent direct, the paper having exclusive use of the wire and employing its own operators.

TO MAKE ICE CREAM.—Scald a gallon of good sweet milk, and add to it with constant stirring eight eggs well beaten with one pound white sugar, and four spoonfuls of corn-starch, first mixed into a thick cream with cold milk. Cool, flavor to suit, and freeze.