The Electric Telegraph.

No. 1.

The controversy and litigation going on at present in our country respecting Telegraphs, is misunderstood by many, because those who have endeavored to set the matter in a *clear* light before the public, have themselves not been sufficiently acquainted with the subject. The dispute does not relate to electricity for conveying messages almost instantaneously to distant places. Electricity was used for telegraphing by Lomond in 1787. He used only the electrical machine and this has been used as a set off to Prof. Morse, but the two telegraphs are very different, as we shall explain in another place. The common electrical machine never could be employed economically for telegraphing, hence until the discovery of Galvanism, we consider all previous attempts at telegraphing as but so many abortive experiments.

Galvanism and Electricity, in some respects are alike, and in others they are not.—Galvanism is continuous in its supply—electricity is not. Galvanism can produce an electro magnet—electricity cannot, and while the former is continuous in its supply, the latter is irregular. The sources of supply, however, may make all this difference, but Prof. Farrady of London, and Professor Donovan of Dublin, have totally different views regarding the nature of both, and with these learned men we will leave this controversy, only stating that electricity cannot operate the electro magnetic telegraph.

Electro Magnetism is different from Galvanism. It is the combination of the galvanic current with a magnet, and the claim set up by Professor Morse, is the use of Electro Magnetism for telegraphic purposes. So says the defenders of Professor Morse—a broad ground—and a claim denied by Professor Morse himself. At any rate—let us make the distinction here, that " a telegraph operated without the magnet, cannot, in the widest sense of the term, be an infringement of a patent for electro magnetism "

Professor Oersted, of Copenhagen, Denmark, was the first who developed the power of lightning in destroying and reversing the polarity of the magnet. This was in 1819.—The first observation of Oersted was that " an electrical current such as is supposed to pass from the positive to the negative pole of a voltaic battery, along a wire which connects them, causes a magnetic needle placed near it to deviate from its natural position." No sooner was this announced to the world than Sir Humphrey Davy discovered that a steel needle, not possessing magnetic properties, became so by placing it in the electric current. This was the first electro magnet, and M Ampere, ot Paris, and Davy made the same discovery at the same time although widely separated from one another, and what is very singular, the needle can be made a permanent or transitory magnet just by placing it in different positions with the wire of the battery. M. Ampere thus explains electro magnetism and the way to construct an electro magnet. " The wire is formed into a hollow screw, or helix, by rolling it round a solid rod wrapping the needle in paper, placing it in the centre of the helix and establishing a communication with the galvanic battery, which conveys the electric current by the spiral convolutions round and round the needle and communicates to it the electric circulation constituting magnetism."

The explanation of the *magnet* and *electro magnet*, as given pages 14 and 15 of Mr. Vail's work, conflicts with the account in the Encyclopedia Americana, page 463, but that does not affect the principle. Electro Magnetism nor the electro magnet was not the discovery of any telegraphic patentee as we have shown, Oersted, Davy and Ampere alone could have secured patents for the discovery, and last, but not least, our own Professor Henry, who undoubtedly made the same discovery independent, about that period. Davy was a man who always gave his discoveries to the public—hence electro magnetism has been common property for 47 years. The principle of conveying intelligence to a distance by an electric current and conducting wires, was known and practised by Reizen in 1794, therefore that was nothing new to the illustrious philosophers whose names we have mentioned. Electro Magnetism then, as a philosophical principle, cannot justly be claimed now by any individual, for any purpose whatever.

A new and improved way of applying electro magnetism to produce certain results, can be patented by the laws of civilized nations, but the means used is the subject—not the principle employed. It is right that a clear understanding should be had of this subject.

(*To be continued.*)

Ivory.

Ivory is the osseous matter of the tusks and teeth of the elephant, the hippopotamus, or morse, &c. The hardest, toughest, whitest, and clearest ivory, has the preference in the market; and the tusks of the sea-horse are considered to afford the best. In these, a rough glassy enamel covers the cortical part, of such hardness, as to strike sparks with steel. The horn of the Narwhal is sometimes ten feet long, and consists of an ivory of the finest description, as hard as that of the elephant, and susceptible of a better polish ; but it is not in general so much esteemed as the latter.

Ivory is very apt to take a yellow-brown tint by exposure to air. It may be whitened or bleached, by rubbing it first with pounded pumice-stone and water, then placing it moist under a glass shade luted to the sole at the bottom, and exposing it to sunshine. The moist rubbing and exposure may be repeated several times.

For etching ivory, a ground made by the following receipt is to be applied to the polished surface :—Take of pure white wax, and transparent tears of mastic, each one ounce ; asphalt, half an ounce. The mastic and asphalt having been separately reduced to fine powder, and the wax being melted in an earthware vessel over the fire, the mastic is to be first slowly strewed in and dissolved by stirring ; and then the asphalt in like manner. This compound is to be poured out into lukewarm water, well kneaded, as it cools, by the hand, into rolls or balls about one inch in diameter. These should be kept wrapped round with taffety. If white rosin be substituted for the mastic, a cheaper composition will be obtained, which answers nearly as well; 2 oz. asphalt, 1 oz. rosin, ½ oz. white wax, being good proportions. Callot's etching ground for copper plates, is made by dissolving with heat 4 oz. of mastic in 4 oz. of very fine linseed oil ; filtering the varnish through a rag, and bottling it for use.

Either of the two first groundsbeing applied to the ivory, the figure is to be traced through it in the usual way, a ledge of wax is to be applied, and the surface is to be then covered with strong sulphuric acid. The effect comes better out with the aid of a little heat ; and by replacing the acid, as it becomes dilute by absorption of moisture, with concentrated oil of vitriol. Simple wax may be employed instead of the copperplate engraver's ground ; and strong muriatic acid instead of sulphuric. If an acid solution of silver or gold be used for etching, the design will become purple or black, on exposure to sunshine. The wax may be washed away with oil of turpentine. Acid nitrate of silver affords the easiest means of tracing permanent black lines upon ivory.

Ivory may be dyed by using the following prescriptions :—

1. Black dye.—If the ivory be laid for several hours in a dilute solution of neutral nitrate of pure silver, with access of light, it will assume a black color, having a slightly green cast. A still finer and deeper black may be obtained by boiling the ivory for some time in a strained decoction of logwood, and then steeping it in a solution of red sulphate or red acetate of iron.

2. Blue dye.—When ivory is kept immersed for a longer or shorter time in a solution of indigo (partly saturated with potash), it assumes a blue tint of greater or less intensity.

3. Green dye.—This is given by dipping blue ivory for a little while in solution of nitro-muriate of tin, and then in a hot decoction of fustic.

4. Yellow dye is given by impregnating the ivory first with the above tin mordant, and then digesting it with heat in a stained decoction of fustic. The color passes into orange, if some Brazil wood has been mixed with the fustic. A very fine unchangeable yellow may be communicated to ivory by steeping it 18 or 24 hours in a strong solution of the neutral chromate of potash, and then plunging it for some time in a boiling hot solution of acetate of lead.

5. Red dye—may be given by imbuing the ivory first with the tin mordant, then plunging it in a bath of Brazil wood, cochineal or a mixture of the two. Lac-dye may be used with still more advantage, to produce a scarlet tint. If the scarlet ivory be plunged for a little in a solution of potash, it will become cherry red.

5. Violet dye—is given in the logwood bath to ivory previously mordanted for a short time with a solution of tin. When the bath becomes exhausted, it imparts a lilac hue. Violet ivory is changed to purple-red by steeping it a little while in water containing a few drops of nitro-muriatic acid.

With regard to dyeing ivory, it may in general be observed, that the colors penetrate better before the surface is polished than afterwards. Should any dark spots appear, they may be cleared up by rubbing them with chalk, after which the ivory should be dyed once more to produce a perfect uniformity of shade.

On taking it out of the boiling hot dye bath, it ought to be immediately plunged into cold water, to prevent the chance of fissures being caused by the heat.

If the borings and chips of the ivory-turner, called ivory dust, be boiled in water, a kind of fine size is obtained.

Formation of Hail.

Professor Stevelley, at a meeting of the British Association, read a paper on meteorological phenomena, in which he attempted to account for the formation of hail, by supposing that it must be formed when after the fall of some rain, a sudden and extensive vacuum being caused, the quantity of caloric abstracted was so large as to cause the rest of the drops to freeze into ice balls as they formed. This principle, he said, had been strangely overlooked, although, since the days of Sir John Leslie, every person was familar with experiments on a small scale illustrative of it. He also said that the interesting mine of Chemnitz, in Hungary, afforded an experimental exhibition of the formation of hail on a magnificent scale. In that mine the drainage of water is raised by an engine, in which common air is violently compressed in a large cast iron vessel. While the air is in a state of high compression, a workman desires a visiter to hold his hat before a cock which he turns ; the compressed air, as it rushes out over the surface of the water within, brings out some with it which is frozen into ice bolts by the cold generated by the air as it expands; and these shoot through the hat to the no small annoyance of one party, but to the infinite amusement of the other.

The Benefit of the Swallow.

These mysterious visitants, creatures of instinct, are by many persons supposed to perform their eccentric gyrations from mere caprice, while, in reality, they are amongst the very best friends of mankind. We would as soon see a man shoot one of our fowls or ducks, or rather he would steal his hatful of eggs from the hen-roost, as shoot one of these beautiful annual visitants, or destroy one of their nests. If it were not for such beautiful and graceful birds, our crops would be totally annihilated by vermin. Take the plant-louse—Bonnet, whose researches on it remind us of Huber on the honey bee, isolated an individual of this species, and found that from the 1st to the 22d of June it produced ninety-five young insects, and that there were, in the summer, no less than nine generations.—These are both wingless and winged, and Bonnet calculates a single specimen may produce 550,080,489,000,000,000 in a single year, and Dr. Richardson very far beyond this ! Now when we see the swallow flying high in the air, he is heard every now and then snapping his bill, and swallowing these and similar destroyers. Now if in summer a swallow destroys some 900 mothers per day on an average, and estimating each of these the parent of one tenth ofthe above number, it is beyond all appreciable powers of arithmetic to calculate.

How far the Provision of Food is due to the Labor of Man.

The number of human beings on the earth is calculated at nearly one thousand millions : all of these are fed from the produce of the ground; for even animal food is itself the produce of the ground. It is true that, for this result, man in general must labor ; but how small an actual portion of this immense productiveness is due to man ! His labor ploughs the ground, and drops the seed into the furrows. From that moment, a higher agency supersedes him. The ground is in possession of influences which he can no more guide, summon, or restrain, than he can govern the ocean. The mighty alembric of the atmosphere it at work : the rains are distilled, the gales sweep, the dews cling, the lightning darts its fertilizing fire into the soil, the frost purifies the fermenting vegetation,—perhaps a thousand other agents are in movement, which the secrets are still hidden from man ; but the viridness of their force penetrates all things, and the extent of their action is only to be measured by the globe ; while man stands by, and has only to see the naked and drenched soil clothing itself with the tender vegetation of spring, or the living gold of the harvest,—the whole loveliness and bounty of Nature delighting his eye, soliciting his hand, and filling his heart with joy.

The Lakes.

The entire line of lake coast is 5,000 miles of which 2,000 constitute the British coast. The following is the result of the survey of the U. S. Topographical Engineers :—

Lake Champlain 105 miles, greatest width 12, average width 8 ; Lake Ontario 180, greatest width 62, average width 30; Lake Erie 240, greatest width 57, average width 38 ; Lake St. Clair 18, greatest width 25, average width 12 ; Lake Huron 270, greatest width, (not including the extensive bay of Georgian, itself 120 miles long, and averaging 45 miles in width,) 105, average width 70 ; Lake Michigan 340, greatest width 83, average width 58 ; Lake Superior 420, greatest width 135, average width 100.

These lakes may be considered as connected throughout their whole extent. Lake Champlain connects with Lake Ontario by means of the river Richelieu, the lock and dam navigation of St. Lawrence river, the Ottowa river, the Rideau Canal through Canada, and the Champlain and Erie Canals of New York. Lake Ontario is connected with Lake Erie by means of the Welland Canal through Canada, and by means of the Oswego and Erie Canals through this State. Lake Erie is connected with Lake St. Clair by the deep navigable strait of Detroit, 25 miles long. Lake St. Clair is connected with Lake Huron by the navigable strait of St. Clair, 32 miles long. Lake Huron is connected with Lake Michigan by the deep and wide strait of Mackinaw, and with Lake Superior by the strait of St. Mary's 46 miles long.

Honesty and Restitution in a Cod Fish.

A sloop was recently lying in Lockbroom, Scotland, the skipper of which when fishing over the side lost the keys of his lockers, &c., from his pocket into ten fathoms of water.—Attached to the bunch was a small piece of parchment on which his name and that of the vessel were written. He, of course, gave up all hopes of the keys again, and gazed on their rapid descent into the watery depository with deep regret. Six weeks afterwards, the skipper cast anchor off the Island of Rassay, about one hundred miles from Lockbroom, and again resumed his piscatory employment. Among the results of his labors was a large cod-fish, which was speedily unhooked and thrown upon the deck; and, to the utter amazement of the skipper, the poor cod, when in the last agonies of death, vomited up his bunch of keys. The parchment being partly preserved proved his property beyond a doubt. At the same time, as if conscience stricken, it disgorged a penknife belonging to a brother skipper, on which his initials were engraved. It is a remarkable circumstance that this fish in its migratory course should arrive at the same spot where the sloop was, sacrificing his life and with its last breath discharging an act of honesty that would have honoured a higher grade or species of animal.—[*Very* "remarkable !"]