

The First Electric Telegraph.

The idea of the practical application of the electric telegraph to the transmission of messages was first suggested by an anonymous correspondent of the *Scots Magazine* in a letter dated Renfrew, February 1, 1753, signed C. M., and entitled "An Expeditious Method of Conveying Intelligence." After very considerable trouble Sir David Brewster identified the writer as Charles Morrison, a native of Greenock, who was bred a surgeon, and experimented so largely in science that he was regarded in Renfrew as a wizard, and eventually found it convenient to leave that town and settle in Virginia, where he died. Mr. Morrison sent an account of his experiments to Sir Hans Sloane, the President of the Royal Society, in addition to publishing them anonymously, as stated above. The letter set forth a scheme by which a number of wires, equal to the letters of the alphabet, should be extended horizontally, parallel to one another, and about 1 inch apart, between two places. At every twenty yards they were to be carried on glass supports, and at each end they were to project 6 inches beyond the last support, and have sufficient strength and elasticity to recover their situation after having been brought into contact with an electric gun barrel placed at right angles to their length about an inch below them. Close by the last supporting glass ball was to be suspended from each wire, and at about a sixth or an eighth of an inch below the balls the letters of the alphabet were to be placed on bits of paper, or any substance light enough to rise to the electrified ball, and so contrived that each might reassume its proper place when dropped. With an apparatus thus constructed the conversation with the distant end of the wires was carried on by depressing successively the ends of the wires corresponding to the letters of the words, until they made contact with the electric gun barrel, when immediately the same characters would rise to the electrified balls at the far station. Another method consisted in the substitution of bells in place of the letters; these were sounded by the electric spark breaking against them. According to another plan, the wires could be kept constantly charged, and the signal sent by discharging them. Mr. Morrison's experiments did not extend over circuits longer than forty yards, but he had every confidence that the range of action could be greatly lengthened if due care were given to the insulation of the wires.

A JARDINIERE, BIRD CAGE, AND AQUARIUM COMBINED.

A correspondent of *La Nature* communicates to that journal a description of a cheap and easily constructed ornamental object that possesses the novelty of being an aquarium, a bird cage, and a jardiniere all in one.

It consists of a large bell glass mounted upon a wooden or iron base, and into the interior of which is introduced a cylindrical glass vessel that has first been loaded with bits of lead or cast iron painted green and other colors, so as to imitate the bed of a spring or clear brook. Upon the bottom of this inner vessel rests a movable perch made of iron rods of small diameter and provided with a foot. The orifice of the cylindrical vessel, as well as that of the bell glass, is covered with wire work having meshes sufficiently wide to admit plenty of air to the birds, while preventing their escape, and sufficiently strong to bear the weight of a row of flower pots.

After the apparatus has thus been constructed birds are introduced into the cylindrical vessel, and gold fish into the water surrounding the latter, while pots of flowers are placed upon the wire work that covers the orifice of the bell glass.

The effect produced upon the spectator by this arrangement is said to be very curious, as the birds seem to be living in the water along with the fish.

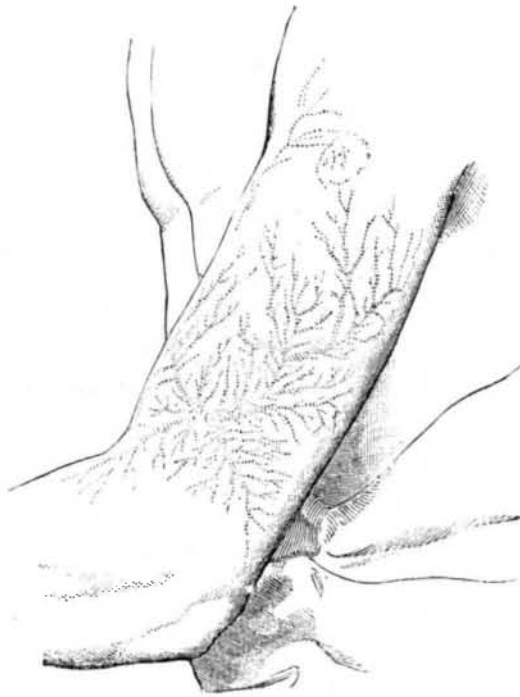
Imported Cattle Disease.

A report of the U. S. Treasury Cattle Commission, under date of August 4, 1883, says that the charges recently made in the British Parliament that American cattle were being received in British ports which were infected with the foot and mouth disease are not true; that the first invasion of the disease into this country was from two English cows brought by way of Montreal, and that "two years ago the steamship *France*, of the National Line, landed in New York a herd of Channel Island cattle suffering from foot and mouth disease. These were quarantined by the State authorities, and the infection stamped out. The *France*, however, after an attempted disinfection, shipped a cargo of American beeves for the return voyage, and these, on arrival in England, were condemned as being infected with foot and mouth disease. This was undoubtedly contracted on board ship. The second case is that of the steamship *Nessmore*, which, in March, 1883, landed in Baltimore a herd of Channel Island cattle suffering from foot and mouth disease. These again were secluded, as soon as detected, by the Pennsylvania authorities, and no evil consequences to our home herds can be traced. But the steamship *Nessmore*, after an attempted disinfection by the agents, shipped a cargo of American fat cattle, and these, on arrival in England, were found to be suffering from foot and mouth disease. This infection, unquestionably contracted on board ship, appears to have been the main if not the sole occasion of the recent questions and resolution in the British Parliament."

In Virginia they are making flour of peanuts. In Georgia the nuts are pounded for a pastry.

LIGHTNING PRINTS ON THE HUMAN BODY.

A photograph by Mr. G. Boner, of Duns, N. B., the first of the kind with which we are acquainted, has been shown to us, in which the impression found on the arm of a boy who was recently struck by lightning is most vividly reproduced. An interesting note on the subject will be found in the *Photographic News* of the 6th July. The objections to the popular idea that the delicately traced figures, so very

**LIGHTNING PRINTS ON THE HUMAN BODY.**

like fern fronds or branches of trees, are caused by the imprint of a near object on the surface of the body are very well put forward. The writer arrives at the conclusion that the markings are caused by the direct action of the electric fluid in paralyzing the nervous system, by causing congestion and redness in the capillary vessels, and the experimental explanation of the tree-like form is clear and satisfactory.—*Lancet*.

[The discharge of static electricity over a very poor conductor, or over a non-conductor when the latter is covered

**BIRDS IN AN AQUARIUM.**

with a film of moisture or dust, assumes an arborescent form, generally spreading in all directions. Discharges of this character from a large inductorium or Holtz machine over a slightly conductive surface are readily produced, and without doubt the lightning picture shown on the arm in the engraving could be readily duplicated by artificial means could a subject be found who would be willing to become a martyr—to that extent—to the cause of science.—Ed. S. A.]

Synthesis of Salicine.

Natural salicine occurs in the bark of the willow tree, and is called a *glucoside* because it is easily broken up by the action of dilute acids into glucose (dextrose) and a resinous substance. There are a large number of natural glucosides, but this is the first one that has been produced artificially by synthetical methods. Although, as in all such cases, some of the preliminary steps had been taken by different chemists, the final successful synthesis was accomplished by Prof. Arthur Michael, of Tufts College, Mass.

The substances employed were not those in common use, and we beg our readers not to be frightened by their names, for the substances themselves are perfectly innocent. Helicine, which had previously been prepared by the author from acetchlorhydrose and sodium salicylaldehyde, was dissolved in water and reduced with sodium amalgam. After filtering from mercury the solution was neutralized with carbonic acid and evaporated to dryness, and the residue extracted with alcohol. After several crystallizations the product was found to possess the chemical composition and other properties of natural salicine.

CINNAMIC ACID.

Prof. Michael has also recently produced cinnamic acid by a new synthesis, viz., by heating benzoic aldehyde and malonic acid for several hours in a closed tube at 130°.

Luminosity of Flames.

Sir W. Siemens, in the *Ann. Phys. Chim.*, says that the luminosity of burning gases is a secondary phenomenon dependent on the separation and incandescence of solid particles suspended in the flame. Gases from which no such particles are separated, burn with a feebly luminous flame, and this luminosity is assigned to the incandescence of the gases themselves. No experiments have hitherto been made to ascertain whether pure gases heated to a high temperature really emit light. In order to examine this point the author's brother made a series of observations with a Siemens regenerative oven of the form used in the hard glass manufacture, whereby a temperature of the melting point of steel, 1,500° to 2,000° C., could easily be attained. By a suitable contrivance the interior of the oven could be examined, and it was found that, provided the experimental room was kept perfectly still, the heated air in the oven emitted no light. The introduction of a luminous flame into the oven caused its interior to be only feebly illuminated. As a result of the experiments, it follows that the supposition that the luminosity of the flame is due to the incandescence of the gas is incorrect.

In order to determine the temperature at which luminous waves become non-luminous, the author suggests a repetition of the above experiments with a more refined apparatus. The author further demonstrates that the heat rays emitted from hot gases are very small in number as compared with those emitted from equally hot solid bodies. Observations on the behavior of flames themselves prove equally that the luminosity of flames is not due to the incandescence of the products of combustion. If the gases to be burnt are more quickly mixed the flame becomes shorter, since the process of combustion is accelerated and hotter, since less cold air is mixed with the burning gas. The same phenomenon occurs if the gases are strongly heated before they are burnt; but since the ascending products of combustion are maintained for a short time only at the temperature of the flame, the above phenomenon would be reversed were the gas self-luminous. The luminous part of the flame is separated by a line of demarcation for the products of combustion, and is coincident with the termination of chemical action, which is probably the cause of the emitted light.

If it be assumed that the gas molecules are surrounded with an envelope of ether, then a chemical combination between two or more of the molecules will cause a vibration of the ether particles, which becomes the starting point of the light and heat waves. The luminosity of gases when an electric current is passed through them can be explained in a similar manner, and the author has already observed that all gases are conductors of electricity when their point of so-called polarization maximum has been reached.

New York Stock Quotations Received via Boston.

Much inconvenience was experienced by business men in New York city and in other portions of the country, August 14, by the cutting of the wires that connect the Stock and Gold Exchanges with the offices of business men. But the value of private wires, which were uninjured by the vandals who tried to disable those of the Western Union, was shown by the fact that the private wires of a firm in New York reaching to Boston were the principal means of communication between the two cities for commercial business. The *Sun* says: The firm of H. L. Horton & Co. obtained their quotations very promptly by way of Boston. The gold and stock wires to that city were not cut, and as fast as the figures came out in the Boston branch office of the house they were telegraphed back to the New York offices over the firm's private wire.

THE statistics of Paris lately published establish the claim of the city to be the most cosmopolitan in Europe. Whether it be a thing to be proud of or not, Paris is chiefly inhabited by a population who are not Parisians. Out of 100 residents only 30 are born within the limits of the city; the remaining 70 are provincials and foreigners.