

## Proof that Electricity is not a Fluid.

An electric spark, however powerful, cannot be made to pass any distance, however small, through a perfect vacuum. It is retarded just in proportion to the nearness to which a vacuum is produced. The degree of perfection in a vacuum may thus be accurately measured. We possess, says the *Manufacturer and Builder*, a tube, in which the two platinum wires are only a quarter of an inch apart, but the vacuum is so perfect that the spark from a large Ruhmkorff coil, which in air passes easily over twelve inches space, and in rarefied air twelve feet, or perhaps any distance, can not be made to pass over the space of only a quarter of an inch of such a vacuum.

If proof were wanting of the non-existence of the so-called electric fluid, it is here; if electricity were indeed a subtle fluid it would pass easier through an absolute vacuum than through rarefied air; but the reverse is the case.

It behaves thus similar to sound, which can not be propagated through a vacuum, even if imperfect. This proves that sound progresses by a certain motion of the molecules of the medium which propagates it; and in the same way the experiment mentioned proves that the existence of an electric fluid is as apocryphical as that of a sonorous fluid would be, and that electricity is simply propagated by a certain motion of the molecules of the materials which we call electrical conductors, and is therefore merely a mode of motion—the same as heat is a mode of motion.

But for heat we have no experiment so directly proving its immateriality as the above experiment proves it for electricity. We are not yet able to make a vacuum so perfect that no caloric rays will traverse it; notwithstanding this, the idea of a caloric fluid has been abandoned by all advanced philosophers, and the theory considering heat as a mode of motion must be acknowledged to be established; how much more then are we entitled to consider electricity as a mode of motion, having succeeded in making a vacuum through which it cannot manifest its action.

## The Demagnetization of Watches.

We have already alluded to the trouble often occasioned by the magnetization of watches, and we now clip from the last number of *Scribner's Magazine* a simple method for demagnetizing these indispensable pocket companions:

"Watches worn by students and others in technical laboratories are often rendered useless by being magnetized by the magnets used in such places. Magnets kept in the house often create equal mischief by being laid near watches, and much time and expense are sometimes needed to demagnetize them before they can be made to work. A serious case of this kind of injury recently led Professor A. M. Mayer, of the Stevens' Institute of Technology, Hoboken, to experiments which resulted in a very simple method of demagnetization. The magnetized watch was laid upon a table in the neighborhood of a common compass needle. Each hour on the face was then placed in turn before it to discover the location and intensity of the magnetism in the watch. The movement of the compass showed the north and south pole to be located (say) at the figures V and XI, while the neutral points were at VIII and II. The watch was then held in a horizontal position before a large bar magnet, the south pole of each being together. A gentle tilting motion was given to it for a moment, and, on trying the watch again before the compass, a sensible decrease of magnetism was observed. The process was repeated till the sensitiveness of the watch at that pole was nearly extinguished, when the same thing was tried with the north pole of the watch. After a few trials and comparisons, the magnetic influence was found to be removed, and the watch readily resumed its work."

FRUIT IN PREHISTORIC TIMES.—Carbonized apples of small size, identical with those growing wild in the woods of Switzerland, have been found abundantly in lake bottoms, and in a tolerable state of preservation. Mr. Messikommer discovered on one occasion more than three hundred of them lying close together. They are often cut in halves, more rarely in three or four parts, and were evidently dried for consumption during winter. Whether a larger kind of apple found at Robenhause was cultivated, or a wild-growing species, remains undecided. Professor Oswald Heer, of Zurich, who has published an interesting work on lacustrine vegetable remains, inclines to the former view. Wild pears were treated in the same manner; but they are far less common than apples, which must have formed a much-sought article of diet. Among other vegetable remains accumulated in the lake mud may be mentioned hazel-nuts and beech-nuts, both in great plenty; also water chestnuts, which doubtless were collected and eaten by the lake-men, as they are in Upper Italy at this day. Their present occurrence in Switzerland appears to be restricted to a tarn in the cañon of Lucerne. Stones have further been found abundantly the stones of sloes, bird cherries, and wild plums, and seeds of the raspberry, blackberry, and strawberry, showing that these fruits of the forest were used as food. According to Dr. Keller, the lake colonists of the Stone Age drew their sustenance chiefly from the vegetable kingdom. Their animal food evidently was acquired by hunting rather than by the breeding of cattle, considering that in the accumulations around the piles the bones of wild animals outnumber those of the domestic species. Milk, we may assume, formed an important article of their diet.

CAR BUILDING FOR THE WORLD.—John Stephenson, whose name is seen on so many of our cars in this State, is the great street car builder of the world. A late visitor at his shops in New York speaks of him thus: He is now over sixty; as hale and vigorous as when he was thirty; under-sized, stocky, robust and cheery; a mechanic of the James Harper school. He makes cars for the world. No nation can compete with or underbid him. While I was talking with him he was making a contract for cars for Bombay. Twelve cars were ready for Liverpool. Others were on the wagon for London. Another lot are for Australia, Norway, Austria, St. Petersburg, and also America, and over our boundless Continent. Liverpool cars are double deckers; but Americans won't ride in them. All English cars have the windows fastened down, and they can't be sold unless they are. These cars the English cannot make, though they have had the pattern for a number of years. Nor can that wonderful nation make a rubber car spring. All are made here. Mr. Stephenson ships no cars. He delivers all his work in New York. Each nation, company, or man who trades for a car pays for it in New York. No contract is taken unless the contractor has a banker in New York who will pay for the car when it is done. Mr. S. builds nine cars a week. He can take an order and have a car ready to ship in four days. Each car costs \$1,000, gold.

AMERICAN SMALL ARMS.—The Sharps rifle company, of Hartford, is experimenting with a new rifle which can be fired three times in a second.

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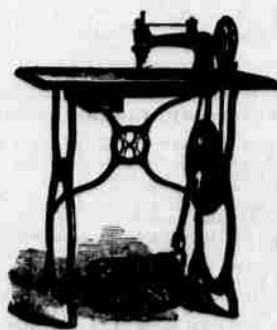
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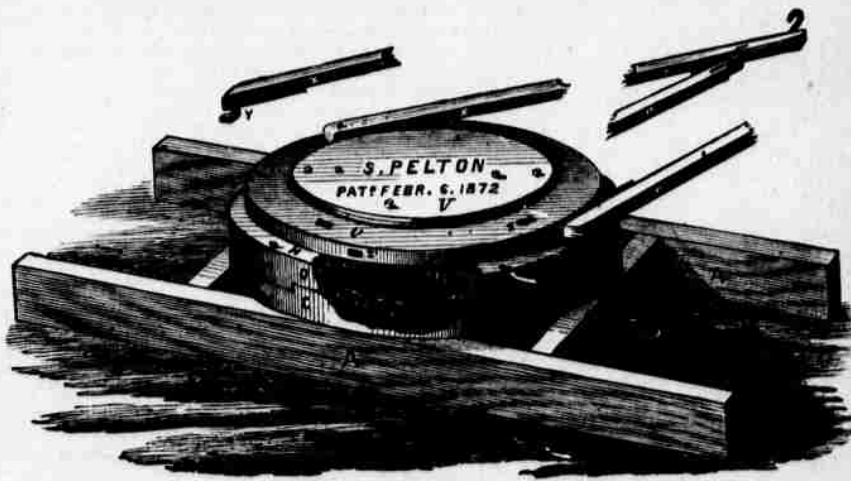
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