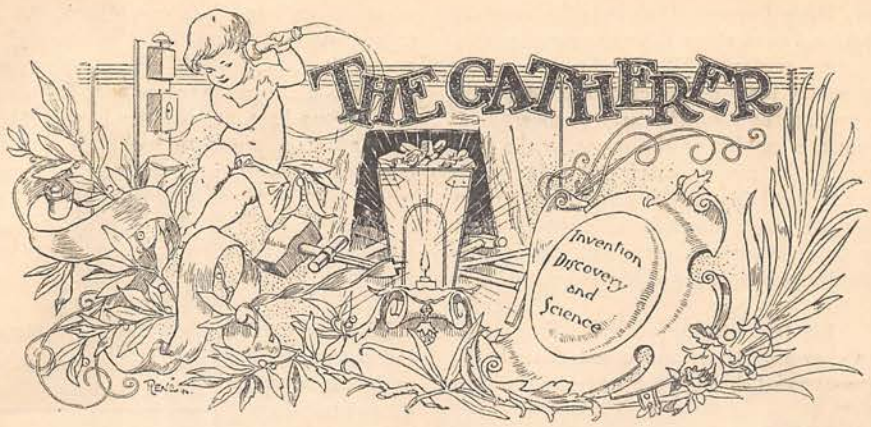

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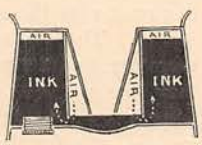
A Low-Level Inkstand.

The "Atmos" inkstand, which we illustrate in Figs. 1 and 2, always gives nearly the same low depth of ink and thus keeps the pen from becoming soiled. The action will be understood from the section shown in Fig. 2. The stand is filled by inverting it and closing the mouth of the well with the stopping-plug in the lid (Fig. 1), then pouring the ink through the plug-hole seen below. Air enters by channels provided for it and helps to keep the level of the ink fairly constant. The reservoir holds seven ounces—a supply which lasts for months and even years, according to the demands upon it.

FIG. 1.

The Sense of Touch.

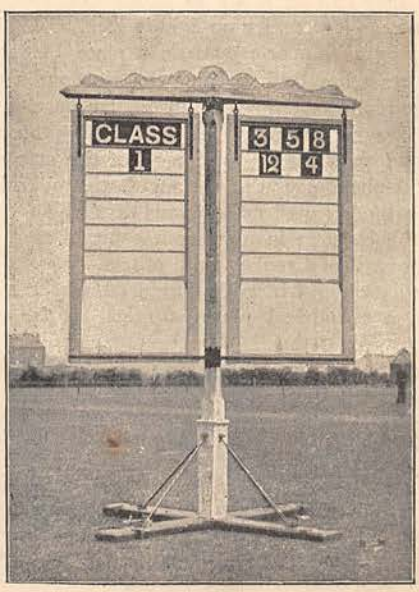
It has been clearly shown that our sense of touch is the true educator of the eye. Professor Dufour, the eminent oculist of Lausanne, has compared a blind person receiving sight to a telegraphist who tries to read a telegram in an unknown code. A grown man, blind from his birth, who had gained the use of his eyes, was unable to tell what he was looking at until he had felt the object. By the sense of hearing a blind person can tell a small tree at a distance of two or three yards, a jet of gas at a yard, and a house at twenty yards, from the sound of his steps or his stick upon the ground. He can tell the height, character, and age of a person from the sound of his voice ; and in a very dark place has a decided advantage over those who can see. It is more difficult to believe that a person both deaf and blind can be taught a trade solely by the sense of touch ; but Edward Meystre, a Frenchman, learned turning, and Helen Keeler, an American, has taught herself to read and write, although they are both deaf mutes. Helen Keeler is a girl of fourteen, and strange as it may appear, is much better informed than most girls of her age. No doubt she is highly intelligent, and her instructors have taken a pleasure in educating her ; but the example shows what can be done by proper training even with those who appear so heavily handicapped in life.



A LOW-LEVEL INKSTAND.
—FIG. 2.

An Indicating Signal Board.

The signal board for use on football or cricket grounds, at athletic meetings or at shows, which is pictured in our illustration, was recently patented by its inventor, Mr. Jowett. To the central post of the



AN INDICATING SIGNAL BOARD.

apparatus are hung frames which may be revolved round the post, and thus show their announcement to all the spectators present. Within the frames are fixed sashes which may be lowered almost to the level of the ground, and which carry grooved rails. By their means the number of the event, or the state of the score, may be readily displayed. The same apparatus may be used for recording the score at any athletic contest, at stock shows, or at open-air sales. An extra supply of letters or figures will immediately make the indicator available for a new duty.

Electric Photography.

It has been shown by Hertz and others that electric induction is propagated through the ether in the form

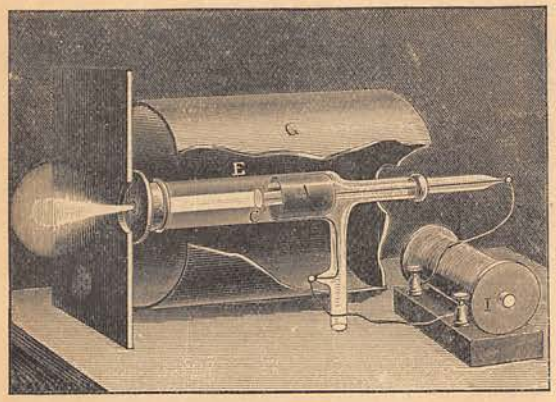


FIG. 1.

of waves, which are similar to those by light, except that they are much larger. If the electrician could produce them of the proper size they would simply be light. As it is they are too large to be visible by the eye, but they can decompose chemicals like light, and hence they can be made to photograph an object in the dark, as it were, for no light is seen. This is done by laying a coin or medal on a plate of sensitised paper in a box, and causing electric sparks to pass from a Holtz machine or Leyden jar near it. The etheric waves, set up by the spark passing through the coin and paper, leave an image of the coin on the film. A phenomenon of a somewhat similar kind is the "cathode rays," or luminous rays which emanate from the cathode in a vacuum tube, as seen in the experiments of Crookes and others. Fig. 1 shows this radiation and how it is produced, where A is the anode, a cylindrical plate of metal in the vacuum tube, E, and C the cathode, a circular plate of metal also in the tube. The anode is connected to the positive, and the cathode to the negative pole of an induction coil, I, by means of wires as illustrated, and the whole is enclosed in a metal box, G. A small circular pane of aluminium foil is inserted in the right end of the tube, and the cathode rays pass through it, although it is opaque to ordinary light, and appear as a luminous haze outside the box as shown. These rays affect a photographic plate, even when it is enclosed in a thin metal box, as shown in Fig. 2, where P is the plate, inside the box. They penetrate the thin metal, and when the plate is developed the luminosity is visible on it, as seen at P^1 on the right of the figure.

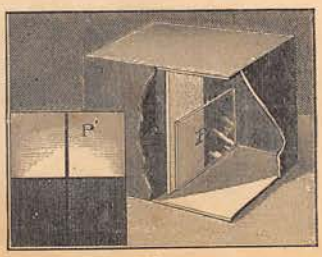


FIG. 2.

Invisible Signals.

When an electric current starts or stops in a wire it induces a pulse of current in a neighbouring wire, and hence the "cross-talk" on telephone lines near each other. The electrical influence is propagated through space from one wire to the other by the ether, as electricians believe, and in the form of "waves" or displacements. This fact is the basis of the new methods of telegraphing from wire to wire through space by invisible signals independent of wind and weather. The post-office electricians have recently made experiments in this way across Kilbranan Sound, between the Mull of Kintyre and the Island of Arran in Scotland, through a distance of four to five miles. Our plan shows the telegraph wires on each side of the water by dotted lines and the telegraph stations on these wires. The short lines shown with dashes were made of gutta-percha covered wire laid along the ground at a height of 500 feet above the sea level and five miles apart. Nevertheless when a telegraphic message was sent in the ordinary way by the Morse Code through one of these lines it was distinctly heard and "read" in a telephone connected in circuit with the other on the opposite shore of the Sound. The currents used in the experiments are vibratory or intermittent in character, that is to say, they are not continuous, like battery currents, but broken up into jets succeeding one another very rapidly, say 600 a second. Such currents produce small waves of induction which evoke a musical note in the distant telephone, and when they are broken up again into the "dot" and "dash" currents of the Morse Code the musical note heard in the telephone is broken up in the same way. Mr. W. H. Preece, C.B., F.R.S., the engineer-in-chief of the Post-office, declares that he has reason to believe that some of the electrical disturbances in our telegraph lines are due to electrical disturbances in the sun's photosphere, propagated by the induction in this manner through the ninety-two million miles of ether which separate the