are to be constructed, at half the distance, and the basin is to have a sufficient depth of water to float the largest vessels.

The work is to be completed in 6 years under a penalty of $60,000, and M. Tuvini has obtained the entire grant for 99 years. It is estimated that the expense of the undertaking will reach about $4,000,000. The advantage to be gained are the avoidance of the *détour* of the Morea and the doubling of Cape Matapan, a dangerous coast in stormy weather, thus materially lessening the journey between Greece and the western countries of Europe.

BISULPHIDE OF POTASH A REVEALING AGENT FOR GALENA.

M. Jannettoz, in *Les Mondes*, says that, on throwing a fragment or a crystal of bisulphate of potash, $\left.\begin{matrix}HO\\KO\end{matrix}\right\}2SO_3$, on roughly ground galena, a very sensible disengagement of sulphuretted hydrogen ensues. If the two substances be ground together, the odor becomes almost unsupportable. It is well known that sulphuric acid, mixed or even warmed with galena, does not give any sensible disengagement of sulphuretted hydrogen, nor do the sulphurets of antimony, of iron, of mercury, of silver, or even those in which the lead and sulphur do not form an isolated combination, give such results with the bisulphate. But if, to any mixture whatever, a fragment of pure sulphuret of lead be added, atthe moment when the rubbing or grinding of the whole with bisulphate of potash takes place, sulphydric acid is given off.

DIRECT DETERMINATION OF THE ELEMENTS OF ORGANIC SUBSTANCES BY A SINGLE COMBUSTION.

Mitscherlich has recently discovered a new mode by which, by direct analysis, not only the carbon, oxygen, and hydrogen in an organic substance can be determined, but also the chlorine,bromine, sulphur,iodine, phosphorus, and probably also the nitrogen therein contained. The organic material is brought to combustion with oxide of mercury, the results of which process are water, carbonic acid, and mercury. The two former are weighed in the ordinary manner. The weight of the mercury formed serves to determine the quantity of oxygen due to combustion, by subtracting which from that contained in the carbonic acid and the water, the total amount of oxygen existing in the substance submitted to elementary analysis is found. If, however, the body under examination contains chlorine, bromine, or iodine, these elements combine with the mercury set free, and are determined by weighing. Sulphur and phosphorus combine in the state of sulphate and of phosphate of oxide of mercury.

PREPARING AMMONIA SALTS.

Bobrownicki, of Paris, proposes to prepare ammonia salts from the ammonia liquor of gas works by acidifying and then treating it with fluoride of silicon, chloride of silicon, hydrofluor-silicic acid, or an alkaline silicate. The silicon compounds carry down the suspended bodies, and those in solution, and hold them in a solid or half solid form. Bobrownicki calls the precipitate a silicoid. It furnishes the crude material for preparing ammonia salts in the usual manner.

NEW REMEDIES FOR CHOLERA.

French physicians, as a rule, hold to the fungoid theory of cholera, and one of their number has been experimenting with the carbolate of ammonia in cases of cholera, so far, we learn, with encouraging success. One physician (Dr. Déclat) looks upon carbolic acid as a prophylactic, to be used in the ordinary way of diet during epidemics. It is taken in the form of sirup. When a patient is attacked with cholera, the sirup should be administered, and a dilute solution of the acid injected. In severe cases, the doctor employs a sirup of carbolate of ammonia, with subcutaneous injections of the same; and he is so confident as to the efficacy of his remedy that, in cases where dissolution is impending, he injects a solution of the carbolate of ammonia directly into the veins.

A Phenomenon of Capillarity.

A curious experiment, due to capillary attraction, was described at a recent session of the French Academy of Sciences. It consists in placing in a flask a small quantity of bisulphide of carbon, and inserting into the liquid a small tight roll of filtering paper, which passes up through a hole in the cork. Owing to the porosity of the paper, the bisulphide ascends; and on coming in contact with the atmosphere, evaporates very rapidly. A temperature is thus produced of very nearly 0° Fah., under ordinary circumstances. The water held in a vaporous condition in the air is consequently condensed and precipitated in the state of hoar frost, which, with the bisulphide, forms, it is said, a peculiar hydrate,which is deposited on paper in a white layer. As new quantities of the bisulphide are continually supplied, the phenomenon continues until a mushroom-shaped excrescence perhaps an inch in hight and broad in proportion, surmounts the flask.

MM. Dumas and Chevreul suggest that this may point to the explanation of certain geological phenomena,such as ferruginous and calcareous concretions, of which the forms are identical with that of the artificial stalagmite described.

FOR the convenience of those dandies who are unequal to the effort required to carry a cane and an eye glass at the same time, C. K. Pevey, of Worcester, Mass., has combined these two articles in one, the glass being set in a bow formed in the handle.

A MODEL of a safety watch pocket in the Patent Office has the following inscription:

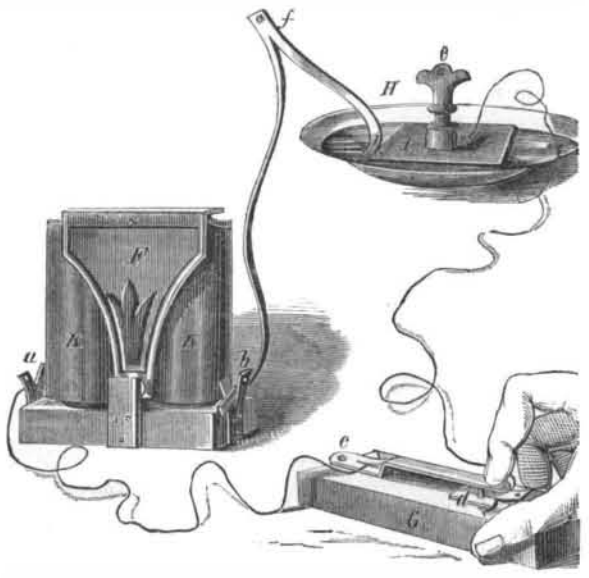
"He that hath a watch, two things must do,
Pocket his watch, and watch his pocket, too."

THE TOM THUMB TELEGRAPH.

There is nothing equal to experiment in impressing the facts of science upon the mind. Faraday used to say, with emphasis, to his pupils, that it was not sufficient to read about magnets and electricity. He advised them to make the magnets, use the electrical machines, and thus become, step by step, positively acquainted with the whole subject. As a means to such ends, we take especial pleasure in calling the attention of our readers to the Tom Thumb Telegraph. It affords the means of illustrating the phenomena of electricity, at a cost so small as to be within reach of almost everybody.

The Tom Thumb Telegraph consists of an electro-magnet, sounding armature, a galvanic battery, telegraph key, connecting wires, and chemicals,all complete for working, which, with excellent directions for use, are furnished for $3: neatly packed, and sent to all parts of the world, on receipt of the price, by the makers, F. C. Beach & Co., 260 Broadway, corner Warren street, New York.

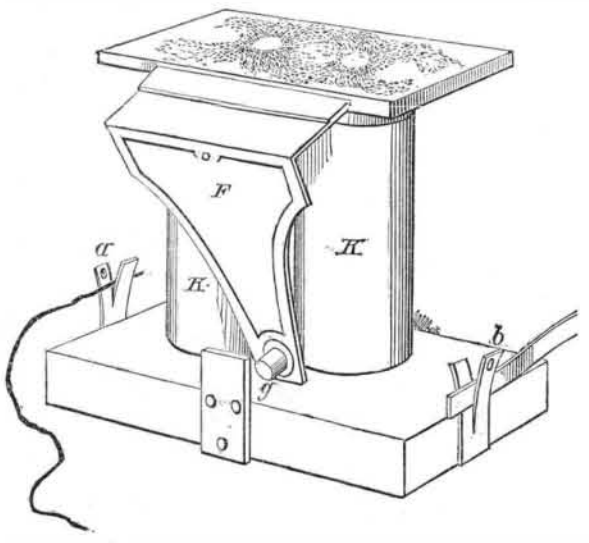
One of these little instruments is now in operation upon our table as we write. We had some curiosity to see what could be done with it, and will here give some of the results: First, as to the battery. It is composed of two small plates, one of lead, one of zinc, the latter covered with paper as a septum, both plates set in a common saucer, in water in which a few grains of sulphate of copper are dissolved. This little battery we found, on trial, to run for two days and a half. The water solution needs to be then renewed, which requires, perhaps, a couple of minutes to do.



THE TOM THUMB TELEGRAPH. FIG. 1.

Next, as to the instrument. It makes a first rate click signal, and is, we think, just as useful for learning the manipulation of the Morse alphabet, and for sending and receiving messages by sound, as any of the larger and more expensive instruments.

In addition to its office as a signal telegraph, this little device may be used for experimenting in many ways, and with it all the principal phenomena connected with electricity and magnetism may be exhibited. Its employment for telegraphing is illustrated in Fig. 1. In Fig. 2 the armature is removed and a slip of glass, with iron filings, placed on the poles of the magnet, K. When the key is pressed, and the glass gently tapped, the filings assume the beautiful positions of the magnetic curves. Removing the glass, needles



THE TOM THUMB TELEGRAPH.—SHOWING THE MAGNETIC CURVES. FIG. 2.

may be magnetized by rubbing on the poles, permanent magnet smade, weights lifted, etc. By connecting one wire with a file and drawing the other wire over the teeth,the electric light, in the form of a sparkling luminosity, may be produced. This is a pretty evening experiment. The electrolysis or decomposition of water into oxygen and hydrogen may be done with the battery, and it may also be used for electro-plating. For these, and other interesting experiments, printed directions are given by the makers. For schools, large or small, the device will be found very useful in the hands of the intelligent teacher, as a means of interesting instruction.

We should find it difficult to select an article of more interest and usefulness for a Christmas gift for young persons than this Tom Thumb Telegraph. It supplies the means for easy self-instruction in one of the most interesting branches of science, with which everybody, old or young, ought to make themselves familiar. These little devices may also be used for office telegraphing as well as for home use and amusement. Any intelligent lad may put up the lines and set them in operation. For further information, and free illustrated catalogues, address the makers as above.

THE MINIATURE TELEGRAPH.

For about a year past we have had in use here, in the office of the SCIENTIFIC AMERICAN, a very simple and convenient little electrical device, termed as above, the Miniature Telegraph, the invention of Mr. Lawrence Duerden, telegraph engineer of the Broadway Underground Railway, in this city. It consists of a pretty little electric bell, shown in its full size in the accompanying engraving, Fig. 1.

THE MINIATURE TELEGRAPH FIG. 1.

As used in our office, these instruments are placed upon the desks in the various departments of our establishment, and from them wires extend to the desks of the managers, on which buttons are fixed, which connect with the wires. When the manager wishes to communicate with any particular person on the premises, he touches the button corresponding to the wire leading to the bell where the individual is at work. The touch sounds the bell, and, as a variety of signals may be sent, one bell may serve to signalize different persons who are within its hearing. It is surprising how many steps the use of this little contrivance saves, and how greatly it facilitates the transaction of our office business. Previous to its introduction, it was necessary for us to employ messengers, who did little else than run from one part of the premises to another, consuming time and making mistakes. This miniature telegraph saves all such

THE MINIATURE TELEGRAPH. FIG. 2.

troubles, and enables the manager, without leaving his seat, to communicate instantly with all the principal persons employed in the concern. (See Fig. 2.) We have seven of these little instruments in use in our office, which serve us in signalizing a large number of persons. For factories stores, shops and offices, for dwellings, in lieu of the ordinary bells, for signaling from house to barn, and for all the thousand and one purposes of business and domestic communication, this improvement is very useful. The makers fit up offices and buildings with them when desired. The device is so simple that any person of ordinary intelligence may put up the wire and set into use. It is so made that by shifting a wire from one screw into another it may be used as a telegraph, giving single signals, or as burglar alarm, making a continuous ringing. The cost is only $5. For this sum, the manufacturers supply one of the bells, like those we use in our office, pictured above, together with connecting wires, chemicals, and a small battery, all complete for working the instrument, with directions for use: neatly put up and sent on receipt of price to all parts of the world by the manufacturers, F. C. Beach & Co., No. 260 Broadway, corner Warren street, New York. At a slight additional cost, the makers supply a larger battery, such as we use in our office, which runs six or eight months without renewal.