The Geological Survey of New Jersey.

We have received from Prof. Geo. H. Cook, State Geologist of New Jersey, three sheets of the topographical map of the State, now in process of completion. Each sheet is 27 by 37 inches in size. Seventeen sheets are to complete the State, of which thirteen have been issued, and the completion of the work is promised in 1888. The scale is one inch to the mile, and the country is laid out in 10 foot contour lines, with special references to heights of points of interest. The work, now so near completion, is of the highest interest and value to all interested in the State of New Jersey. The execution of the maps is most excellent, the work being done by the well known firm of Julius Bien & Co., so long associated with government map work. We also note the receipt from the same survey of the agricultural station report, giving interesting statistics upon the sorghum plantation at Rio Grande, and the results attained by the diffusion battery in extracting sirup from the cane. This review of the well known experiment in northern sugar culture will be appreciated by all sugar manufacturers and planters.

Injury to the Brain.

A most remarkable accident, illustrating the necessity of using the greatest care in fixing cutting tools in machines, is reported in *Science*. While a wood turner of San Francisco was at work at his trade, a steel chisel became detached from a grooving machine, and struck him in the head, producing a fracture of the bones of the nose, and severely injuring the left eye, so seriously as to destroy that organ and necessitate its removal. After the removal of the eye, the surgeons found behind it a piece of steel 3½ inches long, one inch wide at the center, and tapering to sharp points at the ends. One end was buried 1½ inch in the brain. The velocity and force with which this chisel must have entered the brain may be imagined when it is stated that the drum to which it was attached was making 2,300 revolutions a minute. The injury to the brain was not discovered until several days afterward, and the man died at the tenth day.

Cleaning Cherry or Ash.

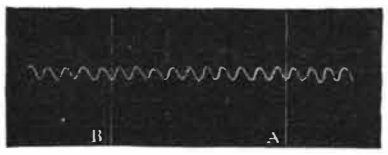
As the proper cleaning and finishing of oak or cherry require considerable care and skill, it will be interesting to notice the practical treatment which the woods undergo under the hands of the woodworker.

Cherry, as in tables, framing, etc., is usually roughed off by the planing machine and worked into its required shape before finishing. When, as in the case of a veneered door, the frame is ready for cleaning off, it is laid on and firmly fastened to the bench by strips cut in between the joggles, then carefully surfaced or leveled over with the fore plane. This is in itself a delicate operation, as the surfaces of the pieces must be exactly flush under a straight edge—that is to say, across the face stiles must be on the same level as the face of the rails, and the latter on the same level as the mullions; in short, the surfaces must all be in the same plane and the stiles likewise straightened. All lumps must be reduced, and great caution exercised to avoid sprawling corners. Use the plane with the grain, as the contrary works out holes, and causes more trouble with the smoother. This done, it is usual to smooth off with a closely set, well-sharpened plane, or, better still, a Bailey iron plane. Some woodworkers object to using the iron plane, as it marks the stuff, and causes much scraping afterward, but it never breaks corners, and will work well against cross-grained stuff like this. Having finished smoothing, proceed to scrape the surface with a scraper which will cut to a shaving. Work carefully with the grain and take out all holes and rough spots, especially near the joints. When scraping across joints, bend the scraper with the hands, and avoid tearing up the grain on either side of the joint. Obliterate every imperfection noticeable before applying the sandpaper, which should be No. 1, and used with a broad, flat cork rubber. On no account sandpaper across the joints, as the grit in the sandpaper will score across the sensitive surface, but work close to the end-wood joint and then with the grain of the jointed stile or rail, as the case may be. Of course the result of the operation depends on the operator's skill, but an exceedingly neat job can be done with a little care.

Ash is, perhaps, the most difficult of all the woods to clean, as the grain is of an open and straight nature, varied with a frequently recurring tough cross spot. Like cherry wood after going through similar treatment, it shows a beautiful surface, which, being filled and varnished or polished, looks rich and glossy, the one dark and warm and the other light and elegant. After sandpapering, rough spots are seen by white blotches, and they can be easily scraped out as before. In these days, when pine is almost obsolete and the hardwoods growing in favor, it is essential that their treatment be understood.—*Owen B. Maginnis in Milling News.*

LONDE'S METHOD OF TIMING PHOTOGRAPHIC EXPOSURES.

The process illustrated in the cuts is a development or improvement by M. A. Londe of M. Vidal's method. To make it perfectly accurate, a tuning fork is used to determine the absolute time. The tuning fork, as a measurer of time, is the only one whose accuracy cannot be questioned, and we believe that, instead of its being restricted to the hands of scientists, it should

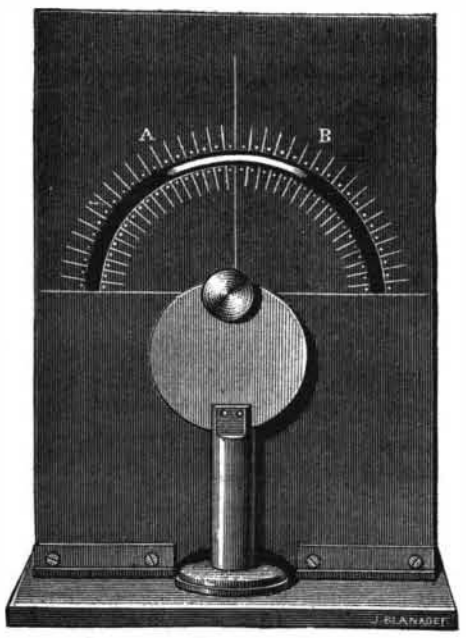


3.—REPRODUCTION OF THE SINOIDAL CURVE IN LONDE'S METHOD.

A.—Beginning of the Impression.
B.—End of the Impression.

be used for our advantage in the interest of our researches.

It will probably be objected that such methods as here described cannot be used by every one. This is indisputable, but it seems clear that to measure hundredths and thousandths of a second requires instruments of great precision, or else it is useless to occupy one's self with such work. To measure such small fractions of seconds by approximate methods appears to us as

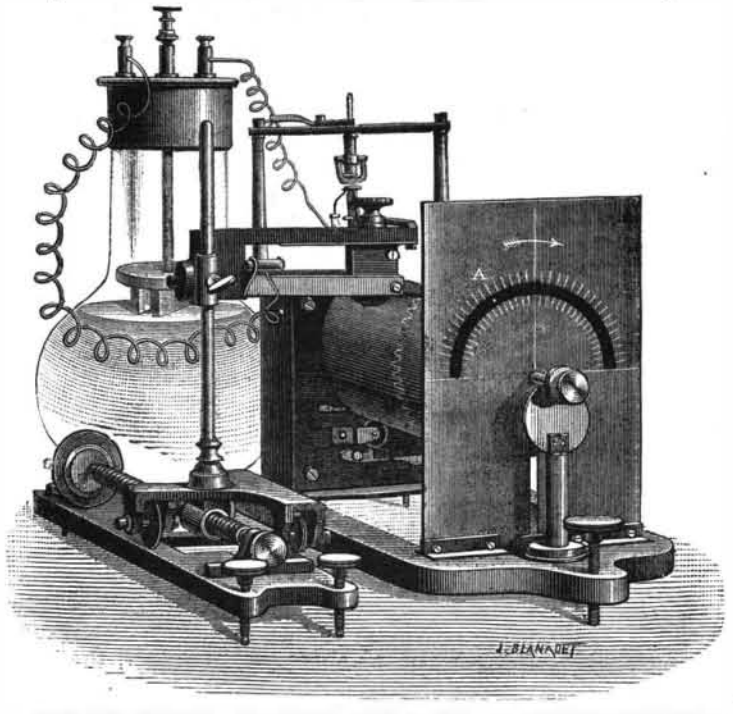


2.—REPRODUCTION OF A PROOF OBTAINED BY LONDE'S METHOD.

A.—Beginning of the Luminous Impression.
B.—End of the Luminous Impression.

of the same nature as weighing milligrammes with gramme weights. As soon as these problems are attacked, the utmost precision is required. In this order of ideas, we have devised the following apparatus:

A registering cylinder is governed by a Foucault regulator. On its end is placed a bright point, a nickel plated head of a nail, for example. The point and cylinder move together. It is its displacement that we photograph. It moves behind a graduated screen pierced with a segmental opening (Fig. 1). The screen



1.—LONDE'S METHOD OF TIMING EXPOSURES.—A, BRILLIANT POINT.

is black; the divisions are white. The cylinder is covered with smoked paper, over which an electric tuning fork carrying a light needle point vibrates. A photographic apparatus is focused upon the dial. The regulator is started, the stylus of the tuning fork is made to touch the paper, and the shutter is released.

The result of an experiment is here reproduced (Fig. 2). The divisions of the dial and the trace, A B, left by the brilliant point are shown clearly. The light began to act at A, and ceased at B. On our sinoidal curve we now must determine to which places these two points correspond, and what time passed between A and B. Nothing is simpler. The cylinder is turned by hand until the point is at A. Here the impression begins. We trace therefore a line which cuts the sinoidal curve, by moving the tuning fork along on its car. The point, A, is referred to the point of intersection of this line and of the curve of sines. The cylinder is rotated until the point reaches B. We trace a second sine, which gives the point corresponding to B. The number of vibrations comprised between A and B must now be counted, to ascertain for what period the light has acted, to know the value of the time of exposure. In the experiment illustrated 10 vibrations took place; the tuning fork gave 250 per second; the time of exposure was 10 250 of a second, or 1-25 (Fig. 3).

In this method, combining graphic and registration methods, regulated movement is not required, as the law of movement of the cylinder is always known. The dial need not be divided with accuracy, as its graduation is only used to establish the positions. The method is really a simplification, while giving most accurate results.—*La Photographie Instantanée, by Albert Londe.*

Protection of Iron.

M. De Meritens, in continuing his experiments upon the protection of iron, has obtained some further results, which seem likely to be of practical importance. The method of protecting an iron or steel surface by the electrolytic formation of a coating of the black magnetic oxide has already been taken up in France as a commercial process. Experiments in this direction have also been undertaken by the French arsenals, and are understood to have led to satisfactory results. M. De Meritens describes his later researches in a note presented to the French Academy, as follows:

"When we submit a piece of iron to the action of the current in a bath of cold water, the formation of magnetic oxide does not immediately take place. The surface of the metal is in the first place coated with a layer of the protoxide of iron. This is a body of which little is known at present. It has not been completely studied by any chemist. Berzelius undertook a prolonged investigation of the substance, but he has never completed the work. The protoxide is the least stable of the oxides of iron. If it is produced by precipitation from a salt of iron, it is immediately converted into the sesquioxide. A similar conversion into the higher oxide takes place when the protoxide formed upon the surface of the metal by electrolysis is exposed to the air, or if the electrode is allowed to remain in the bath after the cessation of the current. If, however, the sheet of iron coated with the protoxide is immediately transferred to a bath containing a solution of a suitable salt of some other metal, such as copper, silver, gold, or aluminum, a perfectly adherent layer of this metal is immediately formed upon the iron. It is probable that the action is due to a partial reduction of the protoxide by hydrogen and the formation of an actual alloy between the two metals, both of which are at the moment in the nascent condition."

M. De Meritens exhibited specimens of iron coated by this process with the several metals named above.

A Candy Temperance Society.

At a recent meeting of the Nineteenth Century Club, of New York City, Dr. Hammond addressed the audience on the subject of "Brain Forcing in the Education of Children." Miss Tate, the principal of one of the city public schools, refuted the idea of any brain injury resulting from the ordinary education, according to the school system. Candy she affirmed to be the evil in the daily life of a large proportion of the youthful maidens of the country. The *Hour* thinks the formation of a temperance society for controlling this particular vice would seem to be as essential to the progress of the country as the suppression of whisky where men are concerned. In fact, cream caramels have never before been presented to the public under so fatal an aspect. A large gathering listened with evident satisfaction to the speakers of the evening. Among those present were Mr. and Mrs. Wm. Hamilton, Mr. and Mrs. Stickney, Professor and Mrs. Boyesen, and Mrs. Bernard. The Marquise De Lanza and Mrs. Charles H. Stebbins received the guests.

IT is reported from Maine that the English sparrows are becoming acclimated, and growing white.