

Science Notes.

Prof. S. P. Langley, of the Smithsonian Institution, states that the bolometer (or actinic balance) is capable of indicating a "change of temperature in its strips of, at any rate, much less than one ten-millionth of 1° Centigrade." The apparatus is about 400 times as sensitive as when first described in 1881.

Those of our readers who are interested in astronomy will be glad to know that they can obtain the lantern slides and prints from the astronomical photographs made at the Yerkes Observatory, at a moderate expense by addressing G. W. Ritchey, optician, at Williams Bay, Wis. He is prepared to supply lantern slides, transparencies and paper prints from any of the negatives in the collection of the observatory. A complete list of the subjects will be sent on application.

Herr W. Zaleski discusses the controverted question whether albuminoid substances can be formed in the plant in the dark. From a series of experiments on sunflower leaves he has come to the conclusion that the nitrates taken up into the leaves are there decomposed and transformed into other nitrogenous compounds. This transformation is connected with the access of sugar, which renders possible the passage of nitrates into other compounds, probably of the nature of amides. These processes can take place in the dark.—Ber. deutsch. bot. Gesell., vol. xv., 536.

Prof. A. Hangsirr proposes the following classification of pollen grains, dependent on their power of resisting moisture and on their protection against unfavorable atmospheric influences: (A) Plants whose pollen is resistant to moisture and germinates in pure water: (a) species in which the sexual organs are more or less protected against rain, etc.; (b) species in which the sexual organs are only slightly or not at all protected against atmospheric precipitations. (B) Plants whose pollen is not resistant to moisture, and does not germinate, or only very imperfectly, in pure water: (a) species in which the sexual organs are completely or partially protected against rain; (b) species in which the sexual organs are only slightly or not at all protected against rain, usually completely exposed. The class to which any particular pollen grain belongs does not depend so much on the affinity of the species as on its special habit.—Sitzber. kön. Böhmisch. Ges. Wiss., 1897.

An interesting illustration of natural engineering is the well-known heavy dike on the Holland coast which was built by the winds themselves. The sand formed between the jetties becoming dry in sunny weather, and the surface blown ashore on the wind blowing in that direction, it was desired to build a strong dike to connect with the sand dunes, and this was accomplished by setting in the sand, in rows about one foot apart, tufts of dune sea grass near by. The tufts thus placed, consisting simply of little handfuls of grass, were put each one into a cavity dug out with the hands, the tufts being set into this and the sand pressed around. The whole surface of the dry, sandy beach above high tide was covered with this plantation, and just back of it, at the highest point of the existing sandy area, one or two rows of reeds were set in the sand, their tops cut off and the stalks left standing about four feet above the sand—the latter drifting along over the surface, catching and in one day almost burying the tufts of grass and standing up one foot along the row of reeds; then another plantation being made, and another, a massive dike was thus built up to the height of the adjoining dike. In high storm tides the waves eat into the top of the slope and pull down the sand, but, by the same process of building, the dike is again restored to its former size.—Invention.

An interesting series of experiments in which a hollow hemisphere of metal was made to collapse by the pressure applied on top of it by another hemisphere or plane is described by Prof. H. Schoentjes, of Ghent, in the current Bulletin de l'Académie royale de Belgique. Prof. Schoentjes gives excellent photographs showing various cases of collapse in segments; triangular, quadrangular, pentagonal and hexagonal forms being all represented. The present paper forms the sequel to one published in 1890, and among the author's conclusions the following are noteworthy: When two similar hemispheres of 10 cm. diameter were crushed together by a hydraulic press with their summits in contact, only one of the hemispheres collapsed; the cavity formed was spherical, and was moulded on the undeformed hemisphere just as if the latter hemisphere were solid. When a hemisphere of 15 cm. diameter was crushed against one of 10 cm., the smaller one penetrated nine times out of ten into the larger one; the cavity was at first spherical, but afterward its margin became polygonal. In one case only—and the author could not succeed in repeating the experiment—both hemispheres were deformed; the larger one first penetrated the smaller, but under a force of 80 kilos. the edge of the cavity began to penetrate the large hemisphere. When a hemisphere was crushed by a plane the normal deformation was found to be hexagonal.

AN IMPROVED TRACE-HOLDER.

The device represented in our illustration is designed to prevent the accidental slipping of a trace from the singletree to which it has been attached. The trace-holder is in general characterized by a spring fastened to the upper or lower side of a singletree and is provided with a hook that embraces the trace and prevents it from slipping off the tree. Our illustration represents part of a singletree with the device attached.

The trace-holder is made of a single piece of spring-wire whose body consists of a coil terminating at one end in two eyes, by means of which it is fixed to the singletree. The other end is formed with a hook having a long beak which extends through a ferrule in the tree



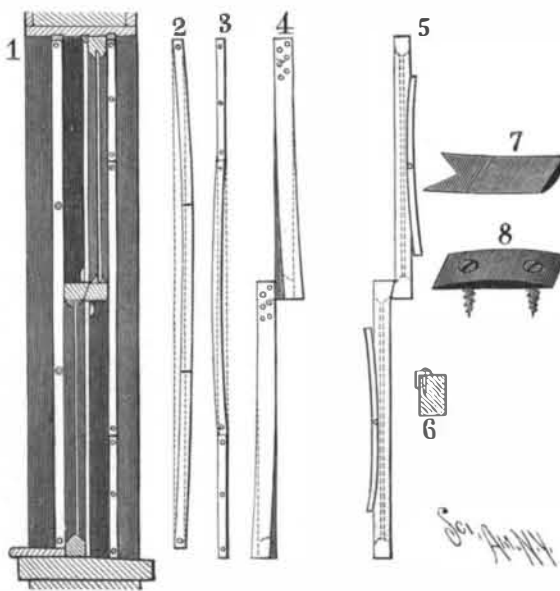
BARTLETT'S TRACE-HOLDER.

to inclose the trace and to prevent its slipping. The wire is doubled on itself to form the hook, and the free end is turned to enter the coiled shank portion. This shank portion has an outward curve and rests against the singletree only at its ends, so as to avoid rattling. In applying the trace, the hook is forced away from the singletree until the slit of the trace may be slipped over the ferrule. The hook is then allowed to spring back, its beak passing through the ferrule and inclosing the trace. The device is the invention of Granville Bartlett, of 360 South Broadway, Lexington, Ky.

A NOVEL SASH-HOLDER.

The sash-holder which we illustrate is the invention of John and Thomas W. Leask, of Gore Bay, Ontario, Canada, and is designed to enable the sashes to be held in any desired position, at the same time preventing rattling. The invention makes use of spring plates flexing edgewise in contradistinction to a flatwise movement, for the purpose of holding the sashes firmly to the frame. Of our illustrations, Fig. 1 is a vertical section of a window frame with the device attached; Fig. 2 is a side elevation of the inner stop and Fig. 3 a side elevation of the outer stop. Figs. 4 and 5 are modifications and Fig. 6 is a cross section of the sash and the spring shown in Fig. 5. Figs. 7 and 8 are detail perspective views of wear plates employed.

The arrangement illustrated in the first three figures consists in applying the spring plates to the sides of the window frame, the sashes sliding in the usual manner. The outer stop differs from the inner stop in employing a spring plate, whose bow is confined to the central



LEASK'S SASH-HOLDER.

portion of the plate, the ends being rigidly fastened. The intermediate portions of the plates constituting the inner stops have slots in which headed pins are inserted, so as to prevent inward bulging of the plates. Fig. 4 shows a modification in which the sashes themselves carry the spring plates. In this case the springs are fastened to the sashes at their inner ends, the outer ends being free. In Fig. 5 another modification is shown, in which the plates are curved throughout their lengths and secured at their centers to the side rails of the sash—a position which may be reversed.

In order to prevent the finish of the sashes from being marred, plates like those shown in Figs. 7 and 8 are employed, which prevent direct contact of the springs with the parting strip of the two sashes.

ACCORDING to Pediatrics, there is a law in France forbidding the giving of solid food of any kind to infants under one year of age without the written consent of a physician. The use of feeding bottles with long rubber tubes is also forbidden by law.

A Curious Safe.

In St. Augustine's Church, Brooklyn, N. Y., the tabernacle of the high altar is protected by probably the most novel safe ever devised. This is undoubtedly the first time in which practical science has been used as an adjunct in religious service. Of course, it was very essential that the beautiful altar itself should not be marred in any way by the safe and that it should be operated in a dignified and fitting manner. Unfortunately, in many churches, the richly jeweled receptacle for the sacrament has proved too often a bait for burglars, and many priests have tried to devise some scheme by which the security and sanctity of the tabernacle would be assured.

In the church to which we have referred the receptacle for the sacrament cost \$10,000. The safe consists of circular curving doors which slide together, closing the front toward the church. The safe weighs 1,600 pounds and consists of four pieces, the base, a curving piece of steel at the back that is stationary and the two doors which come together. The leaves of these doors are made of Harveyized steel an inch thick. They meet as they close under the dome and overlap each other tightly by a scarf joint. They turn on roller bearings and they are operated by means of an electric motor. The safe is easily opened by manipulating buttons beside the tabernacle, but these push buttons will have no effect until the motor itself is set in motion in the vault below, the combination lock of the steel vault being known only to the priests of the parish. Electrical protection is also provided which would give notice at once to the nearest police station should the safe be tampered with. Masked in its covering of gold leaf, this steel shell is a superb piece of mechanism and it is one of the most ingenious uses to which the electric motor has ever been put. The same motor is used to drive a blower intended for the purpose of dusting the elaborately carved marble altar. An exhaust fan sucks away the dust.

The Current Supplement.

The current SUPPLEMENT, No. 1173, contains a number of articles of sterling interest. Subjects connected with the war are naturally in evidence. "The Queen Regent and Alfonso XIII." is accompanied by a portrait of the King and his mother. "The American Regular" is by the English correspondent of The London Times on board the United States transport "Gussie." It gives an Englishman's idea of the regular army. "The Milestones of Human Progress" is a lecture delivered by Prof. Daniel G. Brinton at the Academy of Natural Sciences, Philadelphia, Pa. "Tombs of the First Egyptian Dynasty" is by Dr. Ludwig Borchardt, Director of the German School in Cairo. "An Amateur Chronophotographic Apparatus" describes a simple apparatus. "The Reclaiming of Old Rubber" is a very important paper by Hawthorne Hill and is one of the best contributions to this much neglected division of the literature on rubber. "Patents," by Mr. J. W. See, is continued, and the present installment of this paper deals with the employers' rights, combinations and aggregations, genera and species, combinations and sub-combinations and mechanical equivalents. "The Development of the Central Station," by Samuel Insull, is concluded in this number.

Coaches on the Community Plan in Genoa.

A curious custom exists in Genoa. Many of the well-to-do people as well as those in moderate circumstances do not own either horses or coaches; they own only an interest in them. Four or five or a half dozen great families club together and buy a coach and horses, then they arrange among themselves the days the different families will use it. Thus one family uses the coach on Mondays, another on Tuesdays and a third on Wednesdays, so that an establishment that would be impossible for one family becomes perfectly practical when the cost is divided among five or six. Each family has a set of doors for the coach with their own coat of arms on the panels, which are changed according to the family which is going to use the coach. The builders of these vehicles seldom think of building a coach without five or six sets of doors, and arrangements are made so that they are very easily changed.

American Contracts in Russia.

Under the date of May 21, 1898, Ambassador Hitchcock writes from St. Petersburg that an order has been sent to the Baldwin Locomotive Works for sixty-five locomotives for the Manchurian railway, making a total of eighty Baldwin engines ordered for this railway within the last nine weeks and a total of 138 engines of this make sold to Russian railways within the last six months. The Imperial government has also awarded the Westinghouse Company a contract amounting to between \$2,000,000 and \$3,000,000 for the equipment of rolling stock of the Manchurian railway with Westinghouse air brakes. This contract will probably be duplicated in the near future. It appears that the Manchurian railway is entirely up to date in every particular, being equipped with the very best of American rolling stock.