in connection with previous propositions," it may be questioned if the *deductions* of Section I can be allowed as conclusive in governing the cosmic propositions of Section II. The writer of this notice thinks the author in common with many other book writers and storm authorities fails to appreciate the extreme thinness of the layers of atmosphere and of water in comparison to the superficial extent with which they have to deal and the enormous preponderance of local over general disturbances. Beside this, in the matter of aerial currents, there remains a remark of Sir John Leslie, seventy or eighty years since, on the positive direction of a current of air and the effect of the globular form of the earth when bodies in tangential movement crossed any locality. Together with some general assertion that a cloud or rain is at all times an ascending current, and clear weather a descending current of more or less intensity. On the whole it is hard to discern where the field of usefulness of this second section comes in, for it certainly lays down no laws of practical application.

Still the book must be recommended to students in physics as an extremely valuable contribution to science likely to awaken interest and induce study.

R. B.

Franklin Institute.

HALL OF THE INSTITUTE, Feb. 15, 1882.

The stated meeting was called to order at 8 o'clock P.M.

There were present 122 members and 36 visitors.

The minutes of the last meeting were read and approved.

The Actuary submitted the minutes of the Board of Managers and announced that at the last meeting of the Board 10 persons were elected members of the Institute; he also reported that, by reason of the election of Mr. Frederick Graff to the office of Vice President, a vacancy was thereby created in the Board.

The Chemical Section presented its monthly report, which was read by the Secretary.

The President announced the first paper of the evening, by Mr. Grimshaw, on the determination of the "Driving Power of Belts." An abstract of his remarks, and the discussion thereon, will be found on page 174.

Mr. Lorin Blodget read a paper on "Silk Culture in the United States," for which see page 216.

At the request of Mr. Blodget the Secretary described the "Improved Silk Reel" of the Women's Silk Culture Association, designed and constructed by Mr. Hugo Bilgram, a member of the Institute. While there is no radical departure in its construction from the old forms of hand-reels, the new reel appears to embody every desirable feature that a hand-reel should possess. It is constructed entirely of metal (excepting the bars of the reel), and a skillful operator is enabled to reel upon it at least twice as much silk from the cocoons as upon the ordinary wooden hand-reels.

The report of the Secretary included a *resumé* of progress in Science and the Industrial Arts during the year 1881, and the exhibition and description of a number of mechanical and other novelties, the most notable of which were the following:

Maschmayer's T-Square; a movable blade square that can be clamped and held firmly in any position by means of thumb-screw, which draws a cone attached to the blade into a corresponding socket let into the head, and also lifts it out again when the blade is to be removed. This device was left for exhibition by Mr. L. G. Carr, of Philadelphia.

A similar device, of wood, with tapering blade, accomplishing the same object by substantially the same means, was also exhibited, as the design of Mr. William H. Thorne, Director of the Drawing School of the Institute.

Reed's Sectional Non-conducting Covering for Steam Pipes, Boilers and Water Pipes was shown in several forms. This covering is formed of compact felt represented to be made of the pulp of woolen rags. It is made in 3-feet sections, to fit any sized pipe, and in sheets for boilers, steam drums, etc., according to their size and shape. A saw cut is made the entire length of these sections, so that they may be forced open and sprung upon the pipe, and when in place the seam is fastened with copper staples. In making joints for a bend the sections are sawed off at the proper angle, and the edges of the joint attached as above. The covering is lined interiorly with asbestos, when desired; or an air space is provided, by using sections of larger diameter than the pipe to be covered, and supporting the ends of the sections on collars surrounding the pipe at suitable distances. Exhibited by Messrs. Bowen & Martin, of Philadelphia.

A number of specimens of Celluloid Stereotypes, consisting of

plates of type, engravings, and of impressions of natural objects, such as ferns and leaves, and of delicate fabrics, such as lace, were shown and described. They are intended as a substitute for the metal electrotypes and stereotypes now commonly used. The celluloid surface is represented to be well adapted for use in printing, on account of its hardness, toughness and elasticity. It is said to possess great wearing qualities and powers of resistance, and to be unaffected by acids, alkalis or other chemicals contained in printing inks, so that the plates can be employed with the most delicate shades of colored inks. Other advantages claimed for it are its ability to reproduce the finest lines of a cut or the finest type with accuracy, and its extreme lightness, which will be appreciated where large quantities of printing plates require to be handled and stored.

Wooden Type with Celluloid Face, of various sizes and styles, were shown. These are introduced as a superior substitute for wooden type. These novelties were exhibited by the Celluloid Stereotype Company, New York.

Several samples of mechanical lamps, of improved construction, with fixtures, were shown. They were adapted to burn petroleum or heavy animal oils without a chimney. In the petroleum lamps a blower, actuated by clock-work suitably disposed in the stem of the lamp, furnishes the air supply to the flame. In the lamp adapted for the animal oils the mechanism performs the double duty of furnishing the air supply and of delivering the oil to the wick tube by means of a pump. These were exhibited by the Hitchcock Lamp Company, Watertown, N. Y.

Samples of Cassava, and of products (starch, glucose, etc.) obtained from it were shown. The plant is represented to grow in great quantity in Florida, and it is claimed to be admirably adapted for the manufacture of glucose. The specimens were exhibited by Mr. Frank Higel.

A convenient Developing Lantern, for use in dry plate photography, was shown. It consists substantially of a rectangular tin box, with draught openings at top, and provided with a petroleum lamp, which can be rotated back and forth to face three sides of the rectangle. One face is provided with ruby glass for developing, and with a hood that can be drawn down to protect the eyes. A second face is furnished with a white porcelain pane, and the third with a plain glass window. The latter two are provided with doors, and are

designed respectively for examining the picture, and for printing by contact. This lantern was exhibited by the designer, Mr. John Carbutt, Philadelphia.

A very novel apparatus, in the form of an Opera Glass, that can be converted in a few minutes into a photographic apparatus, was also shown. It consisted of a complete dry plate outfit, adapted to an opera glass case. A matched pair of lenses (one having an instantaneous shutter) are quickly substituted in place of the usual eye pieces of the opera or field glass. The object glass of one tube is replaced by a plate of ground glass for focussing on, while in place of the object glass of the other tube a dry plate holder is easily attached. These changes have turned the opera glass into a photographic apparatus. It can then be directed towards the person or object to be photographed, and when the image is properly focussed on the ground glass the shutter on the other tube is sprung, and the picture is taken. A rolling spring screen then covers the sensitive plate, and it is transferred to the "dark chamber." This consists of a cylinder of black cloth, like a muff, into which the hands can be inserted, and which fits tightly about the wrists by means of elastic bands at both ends. In this the plate is removed and wrapped up, and another plate inserted in the holder for the next picture; the plate may be left until it can be conveniently developed at some future time. The apparatus is adapted to the use of tourists and detectives, and is made by R. & C. Avizard, Paris. It was exhibited by Mr. W. M. McAllister, Philadelphia.

The Norton Door Lock and Spring was described. It consists of a cylinder, piston, spring and adjustable valve. It is provided with two arms or levers, one of which is attached to the top of the door, the cylinder being connected with it by a hinged joint, and the other to the frame over the same. The spring furnishes the power necessary to close the door, and the valve, which can be adjusted to suit each particular case, provides an air cushion for the piston, thus closing the door quietly. This device was exhibited by H. A. Berry, of Philadelphia.

An Insertable Circular Saw Tooth, that can be attached to the saw plate by means of a key working in a wedge-shaped slot, and removed by pushing back the key, was shown. It was exhibited by Mr. A. J. Barrett.

Mr. G. Morgan Eldridge exhibited a model of Wilson P. Dodson's

Safety Switch for Railways, and described the same with the aid of the lantern. It consists substantially of a pair of guard rails, combined with fixed carrying rails in such a manner that they may be vibrated horizontally upon centres at or near their middle part, whereby an operative adjustment of both ends of the guard rails is obtained. The device was stated to have been in use for some months upon the South Mountain Railroad, near Carlisle, Pa., with satisfactory results.

Upon the announcement of the President that new business was in order, Mr. G. Morgan Eldridge moved that an election be held for a manager to fill the vacancy caused by the election of Mr. Frederick Graff to the Vice Presidency. A ballot was taken, and the tellers announced the election of Mr. C. Chabot, to fill the unexpired term of Mr. Graff.

The President named the following Standing Committees of the Institute for 1882:

On the Library.—Chas. Bullock, Lewis S. Ware, Dr. Isaac Norris, Robert Briggs, Henry Bower, Henry Pemberton, J. E. Mitchell, Jos. M. Wilson, Fred. Graff, Dr. W. Lehman Wells.

On Minerals.—Dr. F. A. Genth, Theo. D. Rand, Clarence Bement, Persifor Frazer, Dr. W. H. Wahl, E. J. Houston, Otto Lüthy, E. F. Moody, Dr. G. A. Koenig, H. Pemberton, Jr.

On Models.—C. Chabot, H. L. Butler, Edward Brown, M. L. Orum, J. Goehring, L. L. Cheney, J. J. Weaver, S. Lloyd Wiegand, A. G. Busby, N. H. Edgerton.

On Arts and Manufactures.—J. J. Weaver, George V. Cresson, Hector Orr, Coleman Sellers, Jr., W. B. LeVan, Wm. Helme, J. S. Bancroft, Alfred Mellor, Cyrus Chambers, Jr., Geo. Burnham.

On Meteorology.—Pliny E. Chase, Hector Orr, Dr. Isaac Norris, David Brooks, Jas. A. Kirkpatrick, Alex. Purves, Dr. W. H. Wahl, F. M. M. Beale, H. Carvill Lewis.

On Meetings.—Fred. Graff, Washington Jones, Chas. H. Banes, A. E. Outerbridge, Jr., W. L. Dubois, W. H. Thorne, Cyrus Chambers, Jr., J. J. Weaver, Addison B. Burk.

On motion, the Institute adjourned.

WILLIAM H. WAHL, *Secretary.*