Letters were read from The Society of Arts, London : The Mechanics' Institute of the City of San Francisco ; Thomas U. Walter, Esq., Washington, D. C., and the Kentucky Mechanics' Institute, Louisville, Ky.

Donations to the Library were received from The Austrian Engineers' Association, Vienna ; The Smithsonian Institute ; Thomas U. Walter and T. R. Peale, Washington City, D. C. ; Honorable Joseph R. Chandler, U. S. Congress : The Legislature of the State of Pennsylvania, and Thomas D. Hart ; Dr. L. Turnbull, Prof. J. A. Kirkpatrick, Prof. M. H. Bayé, and Henry Nolens, Philadelphia, Pa.

Donations to the Cabinets from Joseph Mascher, David W. Jayne, and George M. Conarroe.

The Periodicals received in exchange for the Journal of the Institute, were laid on the table.

The Treasurer read his statement for August.

The Board of Managers and Standing Committees reported their minutes.

Resignations of membership of the Institute, from 4 gentlemen, were read and accepted.

Candidates for membership in the Institute, (7,) were proposed and the candidates proposed at the last meeting, (2,) were duly elected.

Dr. Rand exhibited a specimen of aluminium.

Dr. Rand also presented a mass of scale from Messrs. Pardee & Morgan, of New Haven, Connecticut, consisting almost entirely of carbonate of lime, which was taken from an iron cylinder twenty-eight feet long and two feet two inches in diameter, situated in a room over the boiler in which water is turned to steam. This cylinder is kept for warming water previous to entering the steam boiler, and rests on wooden supporters ten inches from the floor. The water is warmed by the application of steam on the top of the water which enters the cylinder through an iron pipe five inches in diameter. The scale was taken from the upper side of the cylinder just around the steam pipe. The water is taken from a well four to six feet from the surface of the ground and one hundred and fifty feet from the bank, which is washed by the waters of New Haven Harbor. It is about two years since this cylinder was cleaned, and there was never before a similar formation in it.

COMMITTEE ON SCIENCE AND THE ARTS.

Report on Mr. Abraham Masson's Steam Motive Power.

The Committee on Science and the Arts, constituted by the Franklin Institute of the State of Pennsylvania, for the promotion of the Mechanic Arts, to whom was referred for examination, a "Steam Motive Power," invented by Mr. ABRAHAM MASSON, of Philadelphia, Pennsylvania—REPORT :

That this engine differs from that class usually denominated "Rotaries" in one essential particular, viz : that neither the piston nor cylinder revolves around the axis of the latter, nor around any line parallel thereto, so that the fundamental objection to rotary engines, usually so called, arising from leakage and unequal wear of packing, cannot be urged against this form of engine. It consists, in general terms, of four cylin-

ders whose axial lines are at right angles with each other and tangents at four points to a circle whose centre corresponds with that of the main shaft; the revolution of the four cylinders about this point, (producing revolution of the shaft to which they are attached,) is obtained by guiding the ends of the piston rods to a fixed involute curve or a curve eccentric with the main shaft. Three modifications of this engine have been designed. In the first plan, the curve is a circle, fixed eccentric with the shaft to which the cylinders are attached. In the second, two (or four) concave involutes are connected continuously and fixed so that their extreme points may be circumscribed by a circle concentric with the main shaft. Thirdly, a single involute forming one-fourth of a complete one is fixed, and the piston rods of each opposite pair of cylinders are connected together, so that the end of at least one of each pair shall be on the curve at any time.

1st. *Originality*.—The Committee understand from Mr. W. C. Grimes, of this city, that a device similar to the first of the three engines above named, was modelled by him some years since, and abandoned as not promising results of practical value. Of this they can speak only on his authority, not having access to the model. The other two forms of engine are, so far as they are aware, original with Mr. Masson.

2d. *Advantages*.—The principal advantage which can be claimed for this form of engine is, equality or uniformity of pressure during the entire revolution. This is, undoubtedly, an important one, but the Committee believe that the employment of two oscillating cylinders disposed on opposite sides of the same shaft, would produce an uniformity so nearly the same as Mr. Masson's engine, as to be considered such in practice, while in such arrangement the space taken up would be, in a line perpendicular to the shaft (and horizontally) not much greater; in the line of the shaft the same; and in vertical height materially less.

3d. *Disadvantages*.—The Committee consider the employment of four cylinders a complexity which would materially increase the expense and wear of the engine, and which would not be compensated for by the slight additional uniformity in motion. On the other hand, it is true, that the valve gearing is remarkably simple, consisting, as proposed by Mr. Masson, of a single ring on each side pierced with openings for the inlet and outlet of steam, pressing against bored cavities in the block containing the four cylinders, which, by their revolution, bring at the proper times, their own steam and exhaust openings opposite those in the ring.

Of the three forms of engine the Committee consider the first described to be the best, as by its use, the jar and wear incident to the other two would be avoided.

The Committee have endeavored to give Mr. Masson's plan all the consideration to which it is entitled, and, although their judgment of its practical value is rather unfavorable, they cannot close their report without remarking on the ingenuity displayed by Mr. Masson, not only in the original idea of such a plan of engine, but in developing it in its details.

By order of the Committee,

WM. HAMILTON, *Actuary*.