

clouds of smoke which overhung the borough, but must make a very pleasing comparison in favor of the present appearance and condition of our streets; and it is not less encouraging to find, from a statement made this morning by Mr. Councillor Howarth, that all this improvement has been effected not only without loss but to the positive advantage of the manufacturers. It is unquestionable that our manufacturers at the outset thought this legislative interference a great hardship; indeed, when summoned before magistrates, it has not been unusual to urge that the mitigation of this nuisance was a delusion, and that the consumption of smoke was utterly impossible."

## FRANKLIN INSTITUTE.

*Proceedings of the Stated Monthly Meeting, December 19, 1850.*

S. V. Merrick, President, in the chair.

Thomas Fletcher, Vice President.

Isaac B. Garrigues, Recording Secretary.

John F. Frazer, Treasurer.

The minutes of the last meeting were read and approved.

Letters were read from Messrs. Fox, Henderson & Co., London, and John M. Bernhisel, Esq., City of New York.

Donations were received from Lieut. W. Reid, London, through W. C. Redfield, Esq.; Messrs. Fox, Henderson & Co., London; Hon. Joseph R. Chandler, U. S. Congress; Messrs. Wm. E. Morris, E. D. Ingraham, and Frederick Fraley, Philadelphia.

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

The Treasurer's statement of the receipts and payments for the month of November was read.

The Board of Managers and the Standing Committees reported their minutes.

The Committee on Exhibitions reported the following resolutions in relation to the subjects referred to them by the Institute at its last meeting:

*Resolved*, That this Committee recommend to the Institute to award to Messrs. Cornelius & Co., of Philadelphia, a Recall Gold Premium, for the Lamps and Gas Fixtures made and deposited by them at the late Exhibition.

*Resolved*, That by our printed circulars, and the same as published in the daily papers, we have advised all depositors that the Institute will not be responsible for any articles deposited at our Exhibition, therefore, with regret, we are compelled to deny the claim for \$10, for the Tidy deposited by Mr. T. Bonney, and lost.

The same Committee also presented the following report:

That they have revised their report of the late Exhibition, and have awarded to  
No. 2611. Composition Marble Mantels, Slabs, and Ornamental Work, made by Thos. W. Dufrene, of Philadelphia, *A Recall First Premium.*  
No. 2603-4-5. Composition Statuary and Figures, made by Edward Dufrene, Philadelphia, *A Recall First Premium.*

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A report from the Committee on the School of Design for Women was read.

On motion, a Recall Gold Premium was awarded to Messrs. Cornelius & Co.

Resignations of membership in the Institute (3) were read and accepted.

Candidates for membership in the Institute (7) were proposed, and those proposed at the last meeting (149) were elected members of the Institute.

On motion, it was

*Resolved*, That the first resolution of the Institute, for the establishment of the School of Design for Women, be altered by substituting the words 'Treasurer of the School Committee' in place of 'Treasurer of the Franklin Institute,' where it occurs in the 5th line of the printed copies of the resolutions.

*Resolved*, That the President be authorized to appoint ten ladies and ten gentlemen a Committee of Visitors to the School of Design for Women.

*Resolved*, That the Committee on Publications present a copy of the Journal of the Institute to the Territory of Utah, agreeably to the request of J. M. Bernhisel, Esq., read this evening.

Nominations were made of persons to be voted for at the Annual Election for Officers, Managers, and Auditors, to be held in January next.

On motion, it was

*Resolved*, That the Annual Election for Officers, Managers, and Auditors, for the ensuing year, be held on Thursday, January 16, 1851, between the hours of 3½ and 8 o'clock, and that seven members be appointed a Committee to receive the votes of the members and report the result.

The Committee were appointed.

Mr. William D. Parrish called the attention of the meeting to the explosion of a steam boiler which recently occurred in Broad street, above Vine, Philadelphia. The explosion took place upwards, carrying off the head of the boiler (which was of cylindrical form, about 4 feet in diameter, and placed in the upright position) entire—the line of fracture following exactly the angle of the flanch with scarcely any variation, blowing off the circular head of the boiler, and leaving the flanch attached to the case of the boiler. This head was carried to the height of several hundred feet into the air, and fell in Broad street, about 100 yards from the boiler. The roof of the building and the adjoining walls were scattered in all directions, but no one was injured, although several workmen were employed at the time very near the boiler, and there were a number of dwellings in the vicinity.

The bottom part of the boiler contained the fire-box, say 38 inches in diameter, which was surrounded by a water leg of about 4 or 5 inches, the fire-hole opening through the leg in the usual manner. On the crown of the fire-box four vertical smoke flues, of about 9 inches diameter, were riveted, passing up into a circular smoke-box corresponding in diameter with the fire-box, and leaving a water space around it of about 4½ inches. One side of this smoke-box was elongated and riveted to the shell of the boiler, thus forming a smoke-pipe passing through the water space, which conducted the hot air into a brick flue of about 4 inches surrounding the

boiler, and distributing the heat over its exterior surface from the point of entrance to the top of the boiler, covering part of the water surface and nearly the whole steam surface. From this brick flue an iron pipe conducted the heat to the smoke stack.

The head of the boiler was made of boiler iron, near  $\frac{3}{4}$ -in. thick, with a flanch turned to fit the inside of the casing, and riveted to it. The man-hole and safety valve were in this head, and it had been secured by 17 stay-bolts distributed over its surface, which passed down and were secured to the crown of the smoke-box.

The boiler had been in use about two years prior to the accident. Two gauge-cocks were placed about 8 or 10 inches above the crown of the smoke-box. The safety valve lever was found much bent, but the valve and valve seat were lost. From inquiry, however, as to the size of the valve, &c., and observation of the diameter of the pipe, it was believed that, with the weight at the end of the lever, it would require a pressure of 160 lbs. to the square inch to raise the valve. The engine was represented as being overtasked, requiring all the steam the boiler could make to do her work, and the explosion occurred during a temporary stoppage for the adjustment of some of the machinery, when the boiler was under her working pressure and generating steam rapidly.

There was no evidence of water having been low in the boiler at the time of the accident, but I was convinced that there had been much carelessness at times by the person having charge of the engine, as it was admitted that extra weights, such as pokers, had been hung upon the safety valve lever on former occasions, although it was stated not to have been done recently. On examination of the iron flanch of the head of the boiler, it was found to be very brittle, and there is little doubt that the angle of the iron was defective at the time the boiler was made, or had been rendered so by the unequal strains to which the head had been subjected, and it was evident by the examination of those stay-bolts which were found, that many of them had been useless for a long time, showing, as they did, very few recent fractures.

Dr. Turnbull presented to the meeting two beautiful specimens of Oxide of Zinc Paint, dry and in oil, one specimen manufactured by the New Jersey Company, from the zinc ore found in Sussex county, N. J.; the second made by Leclaire, of Paris. An oral communication was made by him on the subject of its being perfectly harmless, and not causing any of the attacks resulting from white lead on the human body, and other serious dangers to workmen making or using it, or to persons inhabiting newly painted rooms. It is a purer white, covers as well as the first quality white lead, and does not require a greater number of coats. He exhibited specimens of the paint on glass, and compared it with the finest white lead. The price, at present, is double that of lead, but, on account of its lightness, it will cover a much larger surface.

The New Jersey specimen was as white as the French, and sold at a less price, they having improved very much in its manufacture since last March, at which time he brought the subject before the Institute, the lot marked No. 3 being one obtained from them at that time.

The oxide of zinc paint will be found a most admirable article along

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the sea coast, not being changed by the agents which destroy the white lead, for when acted upon by hydrochloric acid and hydrosulphuret of ammonia it was not altered in color, while the white lead becomes black or brown. It is not changed by sulphurous exhalations so common in cities; it preserves its whiteness in coffee houses, theatres, laboratories, stables, &c.; also in vessels, notwithstanding the gas arising from the hold. Mastics can be obtained with the oxide of zinc, either in oil or water, superior to those made of white lead, and it is now used in the large establishment of the Messrs. Merrick & Son, particularly for the seams in machinery.

This paint acquires a hardness which permits a very fine polish, being a most admirable covering for all kinds of metallic surfaces, and resisting the action of the air.

It is well adapted to artistic painting in oil, water, wax, or water colors, and permits the drawing of the finest lines.

*Mode of Applying the Zinc Paint.*—It is used exactly like white lead on new wood, plaster, stucco, metal, &c., only the workmen must be careful to wash the vessels or brushes previously used for white lead with spirits, not to keep the paint too thick, and to bear on the brush with less strength. The zinc being impalpable, grinding is not necessary. To paint with varnish, resin, or spirits, the zinc ought to be ground first in spirits of turpentine.

The siccative or dryer based on lead should not be used, but a manganese drying oil, which is manufactured for this paint, must be added to it, in the proportion of from three to six per cent. of the oil used.

#### BIBLIOGRAPHICAL NOTICES.

*The Progress of the Development of the Law of Storms, and of the Variable Winds, with Practical Application of the Subject to Navigation; illustrated by charts and wood cuts.* By LIEUT. COL. REID, C.B., F. R. S. London: John Weale. 1849.

The theory maintained by Col. Reid in regard to the great storms being of a vortical nature has long attracted the attention of meteorologists and elicited much discussion. Whatever may be the correctness of the theory, its originator (Mr. Redfield) and himself deserve the credit of having earnestly labored to deduce practical value from it, and, if we are to believe the numerous and constantly increasing records of accidents encountered or avoided by vessels, with no little success. In the present volume additional details of great interest are given upon this subject, and the whole matter copiously illustrated by diagrams and charts, shewing the indications by which the commander may recognize the approach of a storm, its position in reference to him, and the direction of its progress, and the proper course to be pursued in order to avoid as far as possible its evil effects, as well as to shorten their voyages. It would appear that

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