

Franklin Institute.

Proceedings of the Stated Monthly Meeting, September 15th, 1868.

THE meeting was called to order with the Vice-President, Mr. Coleman Sellers, in the Chair.

The minutes of the last meeting were read and approved.

The Actuary submitted the minutes of the Board of Managers, and reported the donations to the Library received since the last meeting of the Institute, from the Royal Astronomical Society, the Royal Geographical Society, the Royal Institution, the Society of Arts, the Chemical Society, the Zoological Society, the Statistical Society, the Institute of Actuaries, London; the Association for the Prevention of Steam Boiler Explosions, Manchester, England; the Geological Survey of India, Calcutta, India; l'academie des Sciences, la Société d'encouragement pour l'industrie Nationale, Paris; la Société Industrielle, Mulhouse, France; der Oesterreichen Ingenieurverien, der K. K. Geologischen Reichsanstalt, Vienna, Austria Mussée Teyler, Haarlem, Holland; the Smithsonian Institution, Hon. Charles O'Neill, Frederick Emmerick, Washington, D. C.; the Mercantile Library Association, San Francisco, California; the Illinois and St. Louis Bridge Company, St. Louis, Missouri; William F. Roberts, Bethlehem, Pennsylvania; B. H. Bartol, Esq., and Frederick Fraley, Esq., Philadelphia.

The Standing Committees reported their minutes.

The report of the Secretary on Novelties in Science and Art was read. After which the meeting on motion, adjourned.

HENRY MORTON, *Secretary.*

Bibliographical Notices.

On the Construction of Iron Roofs. By Francis Campin.

We have received, from Mr. Van Nostrand, (192 Broadway, New York,) what we believe to be the first example of a book printed throughout by the Photo-Lithographic process, a fact that deserves more than a passing notice. Of course, this process can only be applied in the case of a reprint, and produces, from necessity, a

copy that would satisfy the most exacting Chinaman. None but an expert would dream that this book was printed by other than regularly set-up type. The letters are clear, and stand out beautifully upon the fine toned paper upon which they are printed. The plates appear as fac-simile lithographs, and cannot be made to look better than the original. On the whole, it is a most successful specimen of the new art of Photo-Lithography, and the manner of its "get up" is creditable, in the highest degree, to its enterprising publisher. So much for the appearance and mechanical execution of this book, and we turn now to its contents.

As noticed above, it is a reprint from an English work, that has been most favorably met by the profession. It is divided into three parts: Introductory, Theoretical and Practical.

The first part is a concise statement of the proposed treatment of the subject, under the two topics of "roofs proper" and "domes." In the former class are included those supported by arched structures, lattice girders and trusses. The second comprises the various forms of domes. The author having, in two former volumes, considered the usual arrangements for covering, he restricts himself in the one before us to the analysis of the ribs or girders, with some practical examples.

The second part, upon the "Theory of Roof Construction," is most excellent. Clearly stated, with a simplicity of analysis, by which the tyro in engineering could get a complete insight into the action of forces upon such structures. The subject is entirely divested of the "higher mathematics" some writers seem to consider essential to a proper understanding of mechanical constructions, thus making a "terra incognita" of what ought to be at the finger's end of every engineer. The consideration of the arch form for roofs is incomplete, from the fact that no method of investigating the bending action of a load is given, although this question is not ignored by the author. He considers that it will be amply sufficient merely to calculate the direct thrust at the corner and haunches, methods for doing which he gives on p. 21.

This is all very well for ordinary spans; but it seems to us that in enormous spans like the great roof of the St. Pancras Station, the bending moment is of too serious a nature to be neglected.

The third part is devoted to practical illustrations of the theory developed in the second, merely substituting for trigonometrical expressions their "line values," which simplifies the computations

greatly. We notice one error on p. 31, which could not be avoided, as the process employed for printing must necessarily copy all the errors of the original. The error is not of much consequence, as it is easily discoverable. The notation makes $L=ad$, when it should be $L=ab$. The author, in his remarks upon workshop construction, gives thoroughly English views, which are far behind our American practice. Not that Americans have done greater work than the English, but that the American engineer has usually an eye for much simpler details. The author lays much stress upon a proper arrangement for adjusting the parts. This not only necessitates considerable expense in the way of screws and turnbuckles, but also is a dangerous temptation to every mechanic employed in its raising, every one of whom has his idea of "adjustment." In our best American examples, all our roofs are laid out by template, and are either bolted or rivetted, in an unalterable shape, before leaving the shop. When raised, the rafters all pitch in the same plane, to an exactness impossible in trusses adjusted by screws. Then, too, where the English use built sections of "angles," "plates" and "ties," we use solid rolled sections, which simplifies the whole construction. Latterly some of our leading engineers are using wrought iron shoes, instead of cast, a marked improvement on former practice. The plates are full-page lithographs, of a conservatory roof with details, the Broad Street Station of the London and North-western Railway, and the novel roof of the city terminus of the Charing Cross Railway. These three roofs occupy, in all, eight plates.

This is not a voluminous work on roofs, but, as far as it goes, is very complete, and an excellent office companion; and to any engineer who needs a work upon this subject, the contents of which he can apply to his own practice with little labor, we take pleasure in recommending this work of Mr. Campin as, in many respects, the best we have seen.—B.

The Workshop. Edited by Prof. W. Baumer and I. Schnorr and others. No. 8. Published by E. Steiger, 17 N. William Street, New York.

We noticed, some time since, the first numbers of this excellent publication, (which, in its English form, originated with the present year,) and remarked upon the beauty and admirable execution of

the engravings of architectural and other ornaments with which it is filled. (See this *Journal*, Vol. LV., p. 425.) We will at present, therefore, only call the attention of our readers to the fact, that its admirable character is fully maintained, and the present number is, like its predecessors, unrivalled by any publication, both as regards the beauty of its designs or the excellent style of their execution. In addition to its former contents, the work now has, and is to possess in future, if adequately supported, a supplement, containing useful information and advertisements.

The Mechanics' Tool Book, with Practical Rules and Suggestions for use of Machinists, Iron-Workers and others. By W. B. Harrison, Associate Editor of the *American Artisan*. D. Van Nostrand, New York.

This little work will be found of great use by those for whom it is intended, namely, those conducting or employed in small shops, where a few simple tools, such as ordinary lathes and planers, are alone to be found, and must be made to do the work which is to be executed. It does not touch upon the practice of the large shops, where final economy is attained by original large outlay in special machinery for each variety of work, where, to use a familiar expression, somewhat suggestive of the story about "the house that Jack built," a machine is made to make a machine to make a machine.

The author is evidently familiar with the subject he treats, and is evidently relating his own experience, and describing the processes which he has executed with his own hands. Considering its probable readers, one sort of errors with which it abounds are perhaps of little consequence, but it would have done much more credit to its publisher had the number of typographic and grammatical mistakes been reduced to more moderate limits. Thus there are not many pages with less than two, and some, like page 44, with as many as five of such signs of careless proof-reading. E. g. p. 44, "are" for "is" twice, "slope" for "shape" twice, and the word "or" repeated.

A COMPARISON of some of the Meteorological Phenomena of SEPTEMBER, 1868, with those of SEPTEMBER 1867, and of the same month for EIGHTEEN years, at Philadelphia, Pa. Barometer 60 feet above mean tide in the Delaware River. Latitude 39° 57½' N.; Longitude 75° 11¼' W. from Greenwich. By JAMES A. KIRKPATRICK, A. M.

	September, 1868.	September, 1867.	September, for 18 years.
Thermometer—Highest—degree.....	88·00°	86 03°	95·00°
“ date.....	12th.	19th.	12th, '56.
Warmest day—mean ..	82·83	77·83	85·20
“ “ date.....	12th.	6th.	6th, '54.
Lowest—degree.....	48·00	43·00	39·00
“ date.....	17th.	30th.	25th, '56.
Coldest day—mean	54·67	50·00	50·00
“ “ date	24th.	30th.	30th, '67.
Mean daily oscillation...	11·83	14·52	15·72
“ “ range.....	5·70	5·36	4·79
Means at 7 A. M.	64·10	63·12	63·31
“ 2 P. M.	72·18	73·62	74·48
“ 9 P. M.	67·37	66·80	67·08
“ for the month...	67·88	67·84	68·29
Barometer—Highest—inches.....	30·441	30·466	30·466
“ date.....	19th.	24th.	24th, '67.
Greatest mean daily pressure	30·367	30·392	30·392
“ “ “ date...	19th.	24th.	24th, '67.
Lowest—inches	29·764	29·623	29·281
“ date.....	25th.	29th.	18th, '63.
Least mean daily pressure...	29·817	29·726	29·403
“ “ “ date...	25th.	29th.	16th, '58.
Mean daily range.....	0·123	0·136	0·122
Means at 7 A. M.	30·046	30·084	29·963
“ 2 P. M.	29·997	30·050	29·920
“ 9 P. M.	30·021	30·058	29·944
“ for the month.....	30·022	30·064	29·942
Force of Vapor—Greatest—inches	0·846	0·812	0·991
“ date	11th.	17th.	6th, '54.
Least—inches.....	·172	·125	·125
“ date.....	17th.	30th.	30th, '67.
Means at 7 A. M.....	·473	·485	·480
“ 2 P. M.....	·503	·531	·503
“ 9 P. M.....	·505	·528	·519
“ for the month...	·494	·514	·501
Relative Humidity—Greatest—per cent	97·0	95·0	100·0
“ date.....	23d.	3d & 5th.	2d, '54.
Least—per cent....	34·0	28·0	28·0
“ date.....	18th.	30th.	30th, '67.
Means at 7 A. M....	74·8	80·2	78·2
“ 2 P. M....	60·5	61·4	57·2
“ 9 P. M....	72·8	76·9	74·5
“ for the month.....	69·4	72·8	70·0
Clouds—Number of clear days*.....	7·	11·	10·5
“ cloudy days	23·	19·	19·5
Means of sky covered at 7 A. M	73·0	66·3 per cent	59·4
“ “ “ 2 P. M	68·7	49·3	53·1
“ “ “ 9 P. M	59·0	41·7	38·4
“ “ “ for the month	66·9	52·5	50·3
Rain—Amount—inches	8·61	1·850	4·529
No. of days on which rain fell	14·	7·	8·6
Prevailing Winds—Times in 1000.....	S 54° 3' W. 082	N 69° 46' W. 125	N 89° 30' W. 169

* Sky one-third or less covered at the hours of observation.