

NATIONAL ASSOCIATION

OF

CEMENT USERS

PROCEEDINGS

OF THE

EIGHTH ANNUAL CONVENTION

Held at Kansas City, Mo.,

March 11, 12, 13, 14, 15, 16, 1912

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SUMMARY OF THE PROCEEDINGS OF THE EIGHTH ANNUAL CONVENTION.

FIRST SESSION, MONDAY, MARCH 11, 1912, 8 P. M.

The Convention was called to order by the President, Richard L. Humphrey.

John Lyle Harrington, Past President, Engineers' Club of Kansas City, delivered an address of welcome on behalf of the Engineering Interests as follows:

In the dark ages of industry which extended well into the last century, it was the custom for every member of a craft, trade or profession to guard jealously and to keep closely secret every item of knowledge he or his associates had, in order to secure to himself the whole advantage of it. In addition to patenting an invention, it was common to keep secret every possible detail of the processes employed, and many businesses were based wholly upon secret formulæ which were closely held by members of a firm or family, often handed down from father to son, and the utmost precautions were taken to ensure that employees and even associates, as well as competitors, actual and potential, should be kept in ignorance of the methods employed or discoveries made. Even up to the present day it is dangerous in some establishments for an employee to ask too many questions regarding the methods of manufacture or materials he employs in his work, and in certain lines of manufacture a considerable remnant of this old secrecy remains. Here and there the possessor of a formula has, like the old alchemist, at the right moment dropped his fluid into a molten metal or added his mite to the production of important materials and kept the secret and profits thereof to himself.

But early in the last century the civil engineers of Great Britain met and formed an institute for the purpose of disseminating the knowledge acquired by its individual members; and in the latter half of the century the engineers of this country came to appreciate the advantages of co-operation. The first such organizations were few in number and comprehensive in scope, but gradually important groups working in special lines came to feel that the interests of the broad general organization were too varied to permit adequate consideration of the matters which specially occupied their attention and so they split off and organized societies of more limited scope. With the enormous development of industries based on the applied sciences special interests so increased in value and importance that the benefits to be derived from close association and active discussions of men engaged in them came to be generally understood, and group organizations grew apace.

In the course of time, manufacturers began to understand that by keeping to themselves knowledge of their specialities they encouraged like action on the part of their competitors—and each member of that branch of industry developed internally only. This limited the development of all and circumscribed the field of the industry. Gradually it became evident that the advancement of the industry resulting from the dissemination of knowledge of it among those engaged in it more than compensated for the advantage secured even by the most successful operation under the secret methods. As soon as this fact came to be fully realized the organization of special societies for special purposes multiplied rapidly. They reacted upon the industries and the accomplishments of one man so pointed out possibilities and so stimulated others that development has increased in geometric ratio.

Among these later organizations developed to special interests, the National Association of Cement Users has come to occupy an important place.

Cement in some form has been in use for many centuries, so many that its origin is lost in antiquity; but the development of Portland cement and the industries and types of construction dependent upon its use are of comparatively recent date. It is hard to believe that less than twenty years ago Congress gravely questioned the existence in this country of materials essential to the manufacture of first-class Portland cement, and debated whether, in view of that condition, it would be justifiable to impose so much duty on imported cement as would induce its manufacture in this country. Yet last year we produced nearly 78,000,000 barrels, which, at the existing low price prevailing, brought nearly \$68,000,000 at the mills, and the value of constructions in which it was used probably reached nearly \$500,000,000.

It is well, therefore, that the users of cement, the men who are responsible for construction of cement and concrete work worth one-half billion dollars per annum, should organize themselves into an association and meet to advance their special interests by the discussion of the work they are doing and the experiences they have gained. And while it is natural and right that interest and enthusiasm for their work should lead chiefly to the exposition of the successes achieved, it is quite as important that the defects found in the materials, in the constructions and in the methods employed should be exposed and discussed, for we learn as much—often more, if we are wise—from our failures as from our successes. And it is important that the limitations of materials and their uses be fully understood and bad results thus guarded against, and the character of the practices on the whole thus improved. The effort to meet the ever-pressing demand for cheap construction leads to many failures and to much consequent damage to the industry. To increase the stresses or reduce the quality of concrete in order to enable it to compare favorably with wood in first cost is an unwarranted, but far too common practice. If in any instance its many superior qualities do not justify the greater expenditure for good concrete safely stressed, then the cheaper materials should be employed. Wilful, foolhardy risks are responsible for some of the failures, but ignorance of all conditions governing concrete construction

is by far the larger factor, and it is the duty and purpose of this organization to expose bad construction as it is to urge good methods and good workmanship. Concrete construction is peculiarly liable to failure through both ignorance and carelessness. Through ignorance because its use in the simpler types of construction leads men to believe its employment universally simple; through carelessness because it is so amenable to the employment of unskilled labor which needs, but does not always receive, thorough and careful supervision. I well remember the county engineer who was confident he had made all the plans necessary for the construction of a reinforced concrete bridge when he had made a picture on which he had given general dimensions and shown the location of some reinforcement.

Failure to recognize the need of careful inspection of materials and supervision of workmanship is perhaps responsible for the larger portion of failures of concrete structures. Steel is manufactured by skilled men working under able superintendence and so continuously employed that they come to understand the processes thoroughly; whereas concrete is commonly manufactured by an itinerant, common laborer and often directed by a foreman whose only qualification is his ability to handle men. Constructions of wood, brick or stone may be fairly well inspected at any stage or after completion, but the character of concrete construction may not be determined until after the forms are removed, and remedying defects then disclosed is always difficult, often impossible. Too early removal of the forms, thus placing upon the concrete stresses which it is yet unfitted to bear; carelessness and unwise placing of reinforcement; inadequate provision for expansion and contraction due to changes of temperature; weak and leaky forms; inadequate tamping; loose methods of depositing concrete, both in air and under water; excessive dependence in designing upon empirical methods and fallacious load tests; these and many other difficulties must be guarded against and overcome. Much disappointment is certainly in store for the owners of staff and concrete buildings who have not fully appreciated the difficulties in securing construction which will resist the weather. There are many other difficulties which must be guarded against and overcome.

As the use of concrete becomes more general, more attention is given to the sightliness of structures built of it, but too often the efforts in this line are misdirected. It should be clearly recognized that this material is capable of excellent treatment peculiar to itself, and that it is an error to try to make it resemble other materials. The old Spanish structures of southwestern states and Mexico are beautiful because they are true. They were designed frankly to be built of concrete and have forms and finish suitable for that material. It may be that with the wider use and fuller development of concrete construction we may improve upon the work of these Spaniards, but we have not by any means equalled it as yet. The endeavor to meet the needs of the material has too frequently led to the adoption of extreme and grotesque forms and finishes which soon weary or offend.

We are gradually improving the finish of our concrete structures and recent work in this line is especially promising, but much remains to be done both for the appearance and for the weathering quality of concrete and staff

surfaces. Good finish adds to the cost, but the extra expense is surely justified.

The great advantages of concrete, durability, low cost as compared with other equally durable materials, ease of handling, ease of molding to the forms desired, resistance to fire, strength and homogeneity, adaptability to many uses, both with and without reinforcement, resistance to acids and decay, attractiveness of appearance and the wide distribution of its constituent materials, improvements in methods of construction, and the steadily increased scarcity and cost of good timber ensure continual increase in the use of concrete. But perhaps the greatest argument in favor of fireproof concrete buildings is the enormous fire loss this country sustains through the excessive use of wood and the equally great cost of fire insurance. Our losses by fire have become a national disgrace.

The influence of this Association should be very great in combating the tendency of some constructors to secure business and profit by reducing the quality of work. This course surely militates against the interest of cement users as a whole and it brings their work as a whole into disrepute. This was clearly exemplified recently at Los Angeles where the city engineer recommended creosoted instead of reinforced concrete piles for dock construction and was able to justify his position by citing about a dozen failures of docks which were supported on reinforced concrete piles. And generally speaking, any improper use of the material of construction affects adversely the interests of all who engage in the use of that material. There is, therefore, a large opportunity for this Association to benefit greatly the interests of its members and to benefit the country at large by compelling a high standard of ability and integrity among cement users.

It is thus apparent that this Association has met to deal with subjects of the largest consequence and the effects of its discussions will be to improve throughout this country and other countries the practices of concrete design and construction. The work of this Association is, in no inconsiderable measure, the work of the Engineer. He shares largely in the work and the responsibilities and the benefits of this convention; hence it is with pleasure and cordial good will that on behalf of the Engineers of Kansas City, I extend a hearty welcome to the National Association of Cement Users.

An address of welcome on behalf of the Concrete Interests was made by F. W. Fratt, President of the Union Bridge and Terminal Railroad Company.

The President responded:

The Convention has this year been fortunate in having two eminent engineers express thoughts that will be of good service to the Association in its future work. I am sure that you all join me in reciprocating the good wishes which Mr. Harrington and Mr. Pratt have extended to us, and in the hope that our deliberations may prove of interest and value.

The following committees of the Convention, appointed by the Executive Board, were announced by the President:

Committee on Nomination of Officers:

E. J. Moore, *Chairman*, New York, N. Y.
D. A. Abrams, Ames, Iowa.
John L. Conzelman, St. Louis, Mo.
B. F. Lippold, Chicago, Ill.
L. T. Sunderland, Kansas City, Mo.

Committee on Resolutions:

Rudolph P. Miller, *Chairman*, New York, N. Y.
P. H. Bates, Pittsburgh, Pa.
Allen Brett, New York, N. Y.
F. L. Williamson, Kansas City, Mo.
Percy H. Wilson, Philadelphia, Pa.

A paper on "The Use of Reinforced Concrete in Hypochlorite Water Purification Works" was read by Walter M. Cross.

George E. Tebbetts presented a paper on "The Use of Concrete in the New Union Station at Kansas City, Mo.," which was followed by a discussion.

The meeting adjourned until Tuesday at 10.30 A. M.

TUESDAY, MARCH 12, 1912, 10.00 A. M.

Meeting of the Sections on Measuring Concrete, Nomenclature, and Specifications and Methods of Tests for Concrete Materials.

President Richard L. Humphrey in the chair.

The meeting took the form of a discussion on the deposition of mortar with compressed air, its effectiveness and various methods of application.

SECOND SESSION, TUESDAY, MARCH 12, 1912, 10.30 A. M.

President Richard L. Humphrey in the chair.

The report of the Committee on Specifications and Methods of Tests for Concrete Materials was, in the absence of the Chairman, Sanford E. Thompson, presented by Cloyd M. Chapman.

Wm. M. Kinney read a paper on "Aggregates for Concrete,"

which was followed by a Topical Discussion on Concrete Aggregates.

In the absence in Europe of the Chairman, Robert A. Cummings, Edw. D. Boyer presented the report of the Committee on Measuring Concrete, which was followed by a discussion. The Proposed Standard Method of Measuring Concrete was referred back to the Committee, with instructions for a revision in the light of the discussion and report at the next annual Convention.

THIRD SESSION—TUESDAY, MARCH 12, 1912, 8.00 P. M.

President Richard L. Humphrey in the chair.

The annual address of the President, entitled "The Use of Concrete in Europe," was delivered by Richard L. Humphrey.

The following papers were then read and discussed:

"The Design and Construction of the Hollow Reinforced Concrete Dam of the Portland Railway Light and Power Company," by Herman V. Schreiber.

"Cement Coatings in Color," by F. J. Morse.

The report of the Committee on Concrete Surfaces was presented by the Chairman, L. C. Wason. On motion the proposed Standard Method for Tests of Waterproofing was referred to the Committee on Specifications and Methods of Tests for Concrete Materials, for report. Consideration of the proposed Standard Specification for Portland Cement Stucco was deferred until a later session. The changes in the last general report of the Committee were approved.

The report of the Committee on Insurance was, in the absence of the Chairman, Wm. H. Ham, read by title.

The meeting then adjourned until Wednesday at 9.30 A. M.

FOURTH SESSION—WEDNESDAY, MARCH 13, 1912, 9.30 A. M.

President Richard L. Humphrey in the chair.

In the absence of the author, Sanford E. Thompson, the President read the paper entitled "The Practical Design of Reinforced Concrete Flat Slabs."

The report of the Committee on Reinforced Concrete and Building Laws was presented by the Chairman, Alfred E. Lindau, and Arthur N. Talbot, and was followed by a discussion.

The President then presented the annual report of the Executive Board, submitting a proposed revision of the By-Laws, which were amended and ordered to letter ballot. The report was approved.

The change of name of the Association was discussed and on motion the matter was referred to the Executive Board, with authority to effect a change in name if deemed expedient for the best interests of the Association.

The Committee on Nomination of Officers presented the following nominations, which were unanimously approved and the Secretary instructed to cast the ballot for their election:

- President*, Richard L. Humphrey, Philadelphia, Pa.
- First Vice-President*, Edward D. Boyer, Catasauqua, Pa.
- Second Vice-President*, Arthur N. Talbot, Urbana, Ill.
- Third Vice-President*, Edward S. Larned, Boston, Mass.
- Fourth Vice-President*, Ira H. Woolson, New York, N. Y.
- Treasurer*, Henry C. Turner, New York, N. Y.

The time and place of the Ninth Annual Convention was referred to the Executive Board with power to act.

The meeting then adjourned until 3 P. M.

FIFTH SESSION—WEDNESDAY, MARCH 13, 1912, 3.00 P. M.

President Richard L. Humphrey in the chair.

The following papers were read and discussed:

“The Testing of Reinforced Concrete Buildings under Load,” by W. A. Slater.

“The Design of Concrete Flat Slabs,” by Frank J. Trelease; in the absence of the author read by Alfred E. Lindau.

“The Present Status of Unit Construction,” by James L. Darnell.

In the absence of the author, Theodore H. Skinner, the paper on “A Fireproof School of Concrete,” was read by title.

The meeting then adjourned until 8.00 P. M.

SIXTH SESSION—WEDNESDAY, MARCH 13, 1912, 8.00 P. M.

President Richard L. Humphrey in the chair.

The President introduced the Honorable Darius A. Brown, Mayor, who extended an address of welcome to Kansas City as follows:

Mayor Brown.—I am glad of the opportunity to appear before you and express my appreciation of the fact that men should gather together in this city for the purpose of discussing the matters which have brought you here. We have heard about the Stone Age, the Wooden Age and the Iron Age, and I think it is the consensus of opinion that we are now in the Concrete Age and that all of the improved structures are coming to be made of this material. We are also in the age of progress and advancement; we are in an age when people have adopted the idea that if a thing is worth doing at all it is worth doing well and that is the reason why in every branch of human industry, in business, in commerce, in the sciences and in the professions, they gather together periodically for the purpose of discussing the ways and means of better doing the business in which they are engaged.

I am satisfied that the result of your deliberations will not only be of benefit to you in your particular business but will be of benefit to the community in which you live and benefit to the American people as a whole. I hope one of the results of your deliberations will be that the use of concrete will become so perfected that it will not only give us more comfortable buildings and better and more ornamental structures but will decrease the cost of those materials to the people; because that is one of the great problems to be solved.

On behalf of the people of Kansas City I want to extend to you a very cordial welcome and trust that you will not only be benefited by your deliberations but that you will have some pleasure while staying in our city. I thank you.

The President responded:

I am sure we all appreciate the welcome that has been extended by His Honor. A city of this size in whose immediate vicinity there is a production of Portland cement of about one-tenth of that of the entire country, is a good place in which to hold deliberations of this character. In accepting the hospitality of this city we do so with a feeling that we will be benefited. Our conventions have been held heretofore east of the Mississippi River, and I believe that the mingling of the eastern and western ends of this great country cannot help but be beneficial to all. I know you will join me in extending to Mayor Brown hearty thanks for his welcome.

A paper on "The Use of Reinforced Concrete on the Wabash Railroad," was presented by A. O. Cunningham.

The report of the Committee on Treatment of Concrete Surfaces was taken up and on motion the proposed Standard Specification for Portland Cement Stucco was received as information and the Committee instructed to confer with other Associations, in order to reach an agreement as to a specification to be presented at the next Convention.

The following papers were then read and discussed:

"The Design and Construction of a Reinforced Concrete Dome, 220 Foot Span," by S. J. Trauer; in the absence of the author read by the President.

"The Design of Concrete Grain Elevators," by E. Lee Heidenreich.

"The Suitability of Concrete for Gas Holder Tanks," by Herbert W. Alrich; in the absence of the author presented by the President.

"The Necessity of Field Tests for Concrete," by Fritz E. Von Emperger; in the absence of the author presented by the Secretary.

The meeting adjourned until Thursday at 10.30 A. M.

THURSDAY, MARCH 14, 1912, 10.00 A. M.

Meeting of the Section on Treatment of Concrete Surfaces.
President Richard L. Humphrey in the chair.

The meeting took the form of a topical discussion on the coloring of concrete surfaces, contraction, dusting of floors, etc.

SEVENTH SESSION—THURSDAY, MARCH 14, 1912, 10.30 A. M.

President Richard L. Humphrey in the chair.

The following papers were read and discussed:

"Concrete Highway Bridges," by William Scott Gearhart.

"Concrete Bridges," by Daniel B. Luten.

"Flat Slab Bridges," by William H. Finley; in the absence of the author read by the President.

The meeting adjourned until 8.00 P. M.

EIGHTH SESSION—THURSDAY, MARCH 14, 1912, 8.00 P. M.

President Richard L. Humphrey in the chair.

The paper on "The Necessity for Good Roads," by Logan Waller Page, was in the absence of the author presented by E. L. Eldredge.

The following papers were then presented:

"The Necessity of National Aid in Good Roads," by H. C. Gilbert.

"Cement Paving as Constructed at Mason City, Iowa," by F. P. Wilson.

"An Improved Concrete Pavement," by E. W. Groves.

The report of the Committee on Roadways, Sidewalks and Floors, was presented by the Chairman, C. W. Boynton, and the following action taken:

Proposed revisions of the Standard Specifications for Concrete Road and Street Pavements ordered to letter ballot.

The proposed revision of the Specifications on Sidewalks, Curb and Gutter, and the proposed new Specifications for Plain and Reinforced Concrete Floors, were considered and referred to the Committee for report at a later session.

The meeting then adjourned until Friday at 10.30 A. M.

FRIDAY, MARCH 15, 1912, 9.00 A. M.

Meeting of the Section on Roadways, Sidewalks and Floors; C. W. Boynton, Chairman of the Section, in the chair.

The meeting took the form of a discussion on concrete roads, concrete floors, the prevention of dusting of floors, concreting in freezing weather, etc.

NINTH SESSION—FRIDAY, MARCH 15, 1912, 10.30 A. M.

President Richard L. Humphrey in the chair.

The following papers were read and discussed:

"Concrete Fence Posts," by L. J. Hotchkiss.

"The Design of Reinforced Concrete Retaining Walls," by John M. Meade.

"Advantages and Durability of Cement Sewer Pipe," by Gustave Kaufman; in the absence of the author presented by the President.

"Methods of Testing Cement Pipe," by Duff A. Abrams; in the absence of the author presented by W. A. Slater.

"The Manufacture and Use of Cement Drain Tile," by Charles E. Sims.

The report of the Committee on Cement Products and Building Blocks was in the absence of the Chairman, Percy S. Hudson, presented by Clarence K. Arp. On motion the Proposed Standard Recommended Practice for Cement Tile was referred to letter ballot.

The Committee on Roadways, Sidewalks and Floors, C. W. Boynton, Chairman, reported back the matters referred to it and on motion the following were referred to letter ballot:

Proposed Revisions of the Standard Specification for Portland Cement Sidewalks.

Proposed Revisions of the Standard Specifications for Portland Cement Curb and Curb and Gutter.

Proposed Standard Specifications for Plain Concrete Floors.

Proposed Standard Specifications for Reinforced Concrete Floors.

The report of the Committee on Nomenclature was in the absence of the Chairman, Peter Gillepsie, presented by Frank C. Wight and was on motion accepted as information.

The Committee on Education reported progress.

The Convention then adjourned until Saturday at 10.30 A. M.

SATURDAY, MARCH 16, 1912, 9.30 A. M.

Meeting of the Section on Building Blocks and Cement Products, President Richard L. Humphrey in the chair.

The meeting discussed the materials, methods of manufacture and tests of cement drain tile.

TENTH SESSION—SATURDAY, MARCH 16, 1912, 10.30 A. M.

President Richard L. Humphrey in the chair.

The paper by George Gibbs on "Some Notes on the Value and Comparative Cost of Reinforced Concrete Telegraph Poles," was in the absence of the author presented by the President.

The President read in the absence of the author, Robert A. Cummings, the paper on "The Making and Driving of Reinforced Concrete Piles Within Six Days."

The paper by W. J. Towne on "Concrete Fence Posts," was in the absence of the author read by title.

A paper on "Comparative Tests of the Strength of Concrete in the Laboratory and in the Field," was presented by R. J. Wig.

The following papers were, in the absence of the authors, read by title:

"Field Inspection and Tests of Materials for Reinforced Concrete," by G. H. Bayles.

"Unit Cost of Reinforced Concrete for Industrial Buildings," by C. S. Allen.

"Notes on the Deformation in the Webs of Rectangular Concrete Beams," by H. C. Berry.

The President then presented a paper by Alfred D. Flinn on "The Use of Cement for Protecting Steel Pipes Along the New York Aqueduct."

Robert F. Havlik presented a paper on "Modern Methods of Manufacturing Concrete Products," which was followed by a discussion.

The meeting then adjourned until 8.00 P. M.

ELEVENTH SESSION—SATURDAY, MARCH 16, 1912, 8.00 P. M.

President Richard L. Humphrey in the chair.

The paper on "The Use of Concrete in the Fourth Avenue Subway, Brooklyn, N. Y.," was in the absence of the author, Frederick C. Noble, presented by the President.

W. A. Collings presented a paper on "Reinforced Concrete in Agriculture."

The paper by S. B. Williamson on "The Handling of Concrete in the Construction of the Panama Canal," was in the absence of the author, presented by the President.

The following papers were then read and discussed:

"The Present Status of Iron Portland Cements," by P. H. Bates.

"Iron Portland Cement," by Herman E. Brown; in the absence of the author, presented by the President.

The Committee on Resolutions, Rudolph P. Miller, Chairman, presented the following resolutions, which were unanimously adopted:

(a) *Resolved*, That a committee be appointed by the Executive Board to consider the form of all standard specifications or recommended practice issued by this Association with a view to securing uniformity so far as practicable.

(b) *Resolved*, That a committee of five members of this Association, of which one member shall be Chairman of the Committee on Specifications and Methods of Tests for Concrete Materials, be appointed by the President to plan a comprehensive and systematic investigation of the aggregates used for concrete and to interest State Universities, Experiment Stations and other laboratories in carrying out the same.

(c) *Resolved*, That the Executive Board be instructed to consider the advisability of appointing a Committee to report on Standard Specifications for Concrete Highway Bridges and Culverts.

(d) *Resolved*, That the Committee on Nomenclature be instructed and empowered to extend its work to include the standardization of the size of drawings, the symbols used on same and the graphical representation of details.

Resolved, That the Committee on Cement Products be instructed to consider the suggestions and criticisms on building block specifications offered at this Convention, to confer with the Committee on Reinforced Concrete and Building Laws with a view to reconciling there commendations of the two committees, and to report revised specifications to the next convention.

(e) *Resolved*, That a report be submitted to the next Convention on Standard Specifications for Concrete Fence Posts and that the Executive Board consider the advisability of having this done by a sub-committee of the Committee on Cement Products or by a separate committee.

(f) *Resolved*, That the thanks of this Association are hereby tendered the officials and the representatives of the local engineering and concrete interests for their hearty welcome, to the citizens of Kansas City for their co-operation in making this, the Annual Convention, a notable success, and to the guests of the Association for their assistance in this success by the contribution of their interesting and valuable papers.

(g) *Resolved*, That the thanks of this Association are hereby tendered to the members who have aided by the presentation of papers, to the several committees whose efforts have added this meeting to the long series of successful conventions, to the local and technical press whose recognition of the work of this organization is gratefully acknowledged, and to its officers but particularly to its President, Mr. Richard L. Humphrey, for his untiring devotion to the interest and welfare of this Association.

The President thereupon declared the meeting adjourned, *sine die*.