

How well is ACI serving the cement and concrete industry? Three major phases of Institute activity are examined—annual and regional meetings, publications, committee activities.

ACI's Place in a Billion Dollar Industry*

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SYNOPSIS

Retiring ACI President Jackson examines Institute activities in relation to the concrete construction industry. ACI has won for itself a high place among the national professional engineering societies, but that eminence cannot be held without continual vigilance and increased effort on the part of all Institute members. Three major phases of activity are examined—annual and regional meetings, publications and committee functions. Recommendations are presented for improving and increasing Institute activities.

FROM FOUNDATIONS TO FURNITURE

The production of portland cement in the United States reached an all time high last year of 225,000,000 barrels‡—enough cement to build 20 Grand Coulee dams or a four-lane concrete highway around the world at the equator. The actual value of all concrete construction during 1950 would be difficult to determine. However, if we assume that 90 percent of this cement was used in concrete at an average rate of one barrel per cubic yard and that the concrete had an average value of \$10 per yd, we arrive at the impressive figure of roughly two billion dollars for the cost of the concrete alone. Add to this design and construction costs and we have accounted for a substantial part of the 28 billion dollars that has been estimated as the total cost of all construction activities in this country during 1950.

These figures are cited to illustrate that the American Concrete Institute is indeed associated with a billion dollar industry, an industry which has grown tremendously in size and importance during a period which corresponds almost exactly with the life of our organization. Many applications, particularly in the field of reinforced concrete, which are now commonplace were undreamed of at the turn of the century when the uses of concrete were confined almost entirely to mass and foundation work, sidewalks and concrete block. Compare this to the hundreds of ways in which we are

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now using concrete, such as industrial, commercial and business buildings, housing, pavements for highways and airports, highway and railway bridges, even bridges that float, trestles, viaducts and tunnels, chimneys, farm structures, hydraulic and water impounding structures, flood control works, and an almost endless variety of precast products including building units of all sizes and types, ranging from ordinary building block to full size wall and roof sections and precast structural elements, sewer and water pipe, drain tile, light and telephone poles, fence posts, cement-asbestos products, lightweight concrete units and garden furniture. We have even built concrete ships and there is no reason why we should not do so again when and if it can be justified economically. Truly this is an amazing list.

The rapid growth and present pre-eminence of concrete in the construction field is no accident. The possibility of combining concrete and steel to eliminate concrete's one structural weakness, low tensile strength, combined with its potentialities for architectural treatment make it an ideal material for building construction. Its excellent resistance to hurricane, flood, earthquake and bomb damage make it ideal for construction work in areas subjected to such disturbances. Its value from the standpoint of both fire-resistance and sanitation has made it exceedingly attractive to the farmer. And finally, its inherent durability, or weather resistance, made even greater by the introduction of air entrainment, has resulted in its extensive use in exposed structures of every type.

RECENT DEVELOPMENTS

These are rapidly changing times in every phase of human endeavor, and the art of doing concrete work is no exception. Three recent developments are highly significant. These are (1) the increasing use of admixtures in concrete, (2) new developments in precast structural concrete and (3) developments in the application of prestressing.

It is only recently that the word "admixture" has attained the status of respectability so far as concrete usage is concerned. For years we were told that the only ingredients necessary in making concrete were portland cement, aggregates and water. These were the basic ingredients, and the use of any additional material was frowned upon. Then came air entrainment and we soon found that even good concrete could be made better by the use of an admixture. We have learned also that many of the properties of concrete can be improved by replacing substantial amounts of portland cement with a natural or artificial pozzolanic material. These are being used more and more in various types of work either added separately or interground with portland to make blended cements. The possibility of utilizing the large quantities of fly ash that are available in many localities is only one of many aspects of this development.

The increasing use of precast structural members in place of the conventional cast-in-place monolithic type of construction is also of great interest.

The need for low cost housing has created a demand for economical methods of mass construction that is being met by precasting the various structural elements. The obvious advantages of precast construction include elimination of on-the-site formwork (an important item in these days of high costs), close manufacturing control and the possibilities of economical design as compared to conventional procedures.

It is only recently that American designers have awakened to the possibilities of prestressing. Although the process was invented by an American and we pride ourselves on our progressiveness, we have lagged far behind European engineers in developing and applying the theory to actual construction. In Europe, prestressing has passed the experimental stage and is firmly established, whereas in this country the construction of the Walnut Lane Bridge in Philadelphia represents our first attempt to apply the theory to a major structure. However, interest seems to be increasing rapidly. Considerable research is under way and a national conference, in which ACI is cooperating, is being planned to explore the whole problem with special reference to engineering and economic phases peculiar to this country.

ACI ACTIVITIES

How does the American Concrete Institute fit into this picture? How are we now serving and how can we improve our service to meet the need of this important and growing industry?

The Institute was organized in 1905 as the National Association of Cement Users. The original purpose was to bring some order out of the chaotic state of the cement block industry at that time. Its first president, Richard L. Humphrey, served until 1914 and through his efforts and those of such pioneers as Leonard C. Wason, Henry C. Turner, Maxwell M. Upson and Alfred E. Lindau, to say nothing of Harvey Whipple, Secretary-Treasurer since 1919, the status of our organization was raised from what really amounted to a restricted trade group to that of a truly national society dedicated to nonprofit service in the field of concrete. In recognition of this broader objective, the name was changed to American Concrete Institute in 1913 and it was to emphasize still further this concept of service that the Institute was reincorporated in 1945 with the following statement of objectives:

" . . . to organize the efforts of its members for a nonprofit public service in gathering, correlating and disseminating information for the improvement of the design, construction, manufacture, use and maintenance of concrete products and structures. To this field of engineering education its resources shall forever be devoted."

By and large, the Institute has met the obligations for service outlined in its charter. It has done a good job and has won a high place among the national professional engineering societies of this country. A glance at the ACI 20-YEAR INDEX will show the extent and the variety of information that has been made available in the JOURNAL through the volunteer efforts of a comparatively few men who were willing and able to put the results of

their research and experience on paper for the benefit of their fellow workers. I for one do not apologize for our showing. It has been good.

This does not mean that we can afford to be complacent about our record. A self-satisfied, complacent attitude on the part of any organization is fatal. We should continually scrutinize our methods and ask ourselves whether changes in emphasis or in the direction of our efforts may not be desirable.

The three major phases of Institute activity are annual and regional meetings, publications, of which the major item is the JOURNAL, and committee activities.

Annual conventions

The annual conventions have in general been successful. Technical programs are almost invariably of high caliber and cover a wide variety of interests within our field. Although concurrent meetings are not desirable, they are necessary due to the large number of worthwhile papers available for presentation. The research session, started several years ago to give an opportunity for off-the-record presentations and discussion of current material, has become a fixture. I have no criticism of the annual meeting. My only regret is that the vast majority of our members are unable to attend them and thereby participate in the good fellowship and comradeship for men of kindred interests which these meetings afford.

Regional meetings

The first regional meeting was held in Birmingham, Ala., in 1948. It was highly successful due largely to the efforts of a group of local ACI members. The same can be said for the meeting the following year in Boston and the one last year in Washington. These meetings make it possible for many members and friends of ACI to get together who could not attend the regular annual convention. They have proved their value and are a distinct must for the future.

Publications

The JOURNAL is probably ACI's most important single activity. This is the medium through which the product of the research activities and the experiences of contributors reach those who can profit from their work. Furthermore, it is the only way we can reach and serve the bulk of our membership. JOURNAL content is therefore of the highest importance, not only from the standpoint of technical excellence, which goes without saying, but also the necessity of securing the widest possible reader interest. This means diversity of subject matter which in turn means either shorter technical papers and more of them or some other outlet through which the substance of our vast storehouse of knowledge of concrete can be made available in usable form to 5000 present and many additional thousands of potential members.

This question comes up periodically for discussion in the Board of Direction and there have been, for some time, two schools of thought as to the Institute's obligations. One group believes that the pages of the JOURNAL should be reserved for papers and reports of high technical value, including research

reports and that such reports should be complete with all substantiating data. Another group feels that papers and reports should be brief and concise and that research reports in particular should be limited to a condensed statement of objectives, procedures and conclusions, with supporting data available in mimeograph or similar form for the information of the comparatively few members who want such data.

This group believes that only in this way will it be possible for the Institute with its limited resources to give maximum service in terms of the things most wanted by the most people. They believe that only by broadening our publication policy to include more "how-to-do-it" articles will we be in a position to attract a substantial number of new dues-paying members and thereby provide the necessary funds for an expanding service to the industry. The chief difficulty lies in the matter of authorship. Men in the construction field, men who do things and who have developed valuable techniques as the result of their doing are not, as a rule, natural writers. They do not have a "yen" for that sort of thing and, as Roy W. Crum once said, a man must have a yen to write to produce a worthwhile paper. Also, we must remember that everything we produce in the Institute is the result of volunteer effort. We have no staff writers and under ACI's present budget limitations we have no funds to employ them. It is a knotty problem and I can see no immediate solution. The Board of Direction is giving the matter serious consideration and everything possible will be done to expand Institute services to the utmost.

Although we have no staff writers in the usual sense of the term we do have a small but capable editorial staff. This has resulted in a more careful and thorough editing of papers than was formerly possible. Editorially as well as technically the *JOURNAL* ranks high among engineering periodicals.

In addition to the *JOURNAL*, we have published a number of standards—mostly in the form of recommended procedures. Outstanding among these are the "Building Code Requirements for Reinforced Concrete" and the "Manual of Standard Practice for Detailing Reinforced Concrete Structures." Continued effort is being made to keep these and other standards abreast of the times. Both the code and the manual are being revised this year to take advantage of improvements in design made possible by the development of the high bond reinforcing bar.

The development of such standards as the Building Code, which is used as the standard for reinforced concrete design in the building codes of most of our large cities and the Detailing Manual, used extensively in the office, drafting room and school, rank among the most important ACI activities and illustrate very well some of the ways that our organization can be of service to the industry. We should have more standards of this type.

Technical committee activities

If there is one phase of Institute endeavor that has not functioned as well as it should, it is our technical committee activities. I am not criticising any

particular committee nor am I questioning the value and high caliber of the work done by the various committees. I am concerned entirely with rate of progress. This does not mean of course that all of our committees are inactive. Some of them I happen to know have been very active. Nevertheless, committees of the Institute just like committees of similar organizations have a tendency to stagnate unless they have a specific and clearly defined objective together with an urge, spark-plugged by someone, usually the chairmen, to get the job done. I am afraid that this is the situation so far as some of our committees are concerned.

In an attempt to overcome this tendency, the Technical Activities Committee recently recommended to the Board that the rules governing committee activities be revised to require that members be appointed for a two-year term and that all reappointments be contingent on continued activity in committee work. This should make it easier to eliminate "dead wood" and introduce new blood into committee work. Speaking of new blood, I wonder if you realize that out of a membership of over 5000, there are just 152 individuals or 3 percent who are members of technical committees. Fifty of these members belong to two or more committees and 17 of them belong to three or more committees. I wonder if the time has not come to give some of our younger men an opportunity to participate in committee work.

At the present time our 30 technical committees (excluding Committee 115, Research) average only 8 members each. I believe that many of them could be enlarged by the addition of some of the younger men. It is inconceivable to me that of approximately 5000 members not now affiliated with any committee, there are not some who would make excellent committee material.

There is just one more phase of Institute activity to which I should like to refer briefly—field control. It is a field which has been sadly neglected. Nevertheless, it is an obligation equally as important as the task of analyzing and correlating the findings of research or the writing of specifications. Although we have made considerable progress in closing what Sheets many years ago so aptly called the gap between theory and practice we still have far to go. Let me cite just one example. It is a matter of common knowledge among concrete men that, in many places, field procedures for control of the quality of ready-mix concrete are quite inadequate, if not actually nonexistent. Although we who are in the business of building highways pride ourselves on the quality of our field inspection in general, the control of ready-mixed concrete is a major problem of the materials departments of many states. It is even more of a problem with some municipalities.

Ready-mixed concrete constitutes an important and rapidly expanding branch of the industry. In 1949, nearly 28 million cu yd were produced. It is here to stay and steps must be taken to develop adequate field control procedures. The industry itself is alive to this problem and has developed a recommended practice primarily for the use of its own operators. What is needed is a national standard sponsored by some such organization as

ACI that can be used as a code of practice by municipalities and other agencies concerned with safeguarding the quality of concrete in their structures. I believe the development of such a recommended practice is a responsibility of the Institute. We are not concerned here with a specification; ASTM has written a specification. We are concerned with procedures for enforcing the specification.

ACI FINANCES

Brief reference to our present financial situation is desirable. As you know, funds for the various services which ACI provides are derived mainly from three sources—member dues, sale of publications and advertising. Institute membership is now the highest in its history—5243 as of Jan. 31, 1951. Total net gain for 1950 was 331 or approximately 7 percent as compared to 11 percent in 1949 and 17 percent in 1948. Although the rate of gain appears to be decreasing, the membership picture in general is good. Publications sales were approximately the same as for the preceding two years. Receipts from advertising were about the same as in 1949 but considerably below the banner year of 1948. Total receipts for the year were \$128,919.85, about the same as for the past three years but more than four times what they were in 1940.

Expenses during the year have also been the highest in our history, due principally to skyrocketing printing costs and other items essential to the continuing operation of the Institute. Net operating expenses for the year amounted to \$137,659.14, leaving a deficit of \$8739.29. This has decreased our working surplus to \$27,652.69 compared to \$36,391.98 in 1949 and \$41,010.93 in 1948. These figures are quite disturbing. No organization can continue to draw upon its surplus to finance an operating deficit and survive. We are in the same situation as many similar organizations. Rapidly mounting costs have far outstripped receipts, which have remained at approximately the same level during the recent period of rapid inflation. Two courses of action were open to the Board. It could either order a drastic curtailment of operating costs which would mean reducing by a substantial amount the sum total of the services which you now receive and are entitled to receive or it could attempt some adjustment in revenue potential with the hope of increasing total receipts sufficiently to balance the budget. As you know, the Board took the latter course and the convention ratified the recommendation that members dues be increased. Needless to say, the Board was extremely reluctant to take this action. It felt, however, that this was the only way in which the Institute could continue to function without loss in service to members and that the membership at large would understand the situation and would continue its loyal support of our work as in past years.

CONCLUSION

We are gathered here in San Francisco for our 47th Annual Convention during a period of great national emergency. We know from experience

that the national defense program now getting under way will profoundly affect the economic life of the nation. We are in for another era of wartime scarcities and no one can foresee the end. All we know is that things will probably get worse before they get any better. The concrete industry along with others will be faced with a shortage of critical materials—cement, aggregates and reinforcing steel. The civilian consumption of concrete will be cut as nondefense building operations are curtailed but this cut will probably be offset by increased demands of the defense agencies. Therefore, in the allocation of critical materials, consideration will have to be given to the part played by concrete in our mobilization for defense so that the industry may do its part.

The American Concrete Institute as an organization stands ready to do its part. Our plans for the future are being made in the hope that we shall be able to carry on in our usual manner. However, if sacrifices such as the temporary curtailment of some of our normal functions are necessary they will be made cheerfully. They were necessary during the last war and they may be required again. Of one thing, however, I am confident. The Institute stands ready to cooperate in every way possible in the united effort to create an impregnable defense against any attempt to control our way of life, no matter how powerful it may be or in what form it may appear.