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IMMEDIATE NEED FOR RESEARCH IN STRUCTURAL  
CLAY PRODUCTS INDUSTRY

BY

DOUGLAS F. STEVENS

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# IMMEDIATE NEED FOR RESEARCH IN STRUCTURAL CLAY PRODUCTS INDUSTRY\*

BY DOUGLAS F. STEVENS

## ABSTRACT

Present world conditions and their effect on the structural clay products industry are described. New products and new methods must be developed to meet the increased competition of nonceramic products. Extensive research on materials, equipment, processes, and products is needed immediately if this industry is to meet these rapidly changing conditions.

### ECONOMIC CONDITIONS

Owing to the present vast military program, the structural clay products industry is facing the same paralyzing effects which military preparations engendered during the last World War. Labor has become increasingly scarce, with resulting reduced efficiency and increased costs. Governmental restrictions have been placed on supplies needed in the manufacture of structural clay products. These restrictions may force manufacturers who are unable to secure priority orders to shut down their plants.

### RECONSTRUCTION PERIOD

When peace comes, what conditions will confront the structural clay products industry? Judging from past experience, a long period of splendid business caused by the resumption of delayed building construction might be anticipated. This conflict may end, however, with many nations in such conditions of economic restriction and exhaustion that foreign trade may be impossible. The termination of the tremendous military preparations in the United States may seriously disturb all normal industries for some time, and building construction may be resumed very slowly. The industry may therefore have to face the continuation and the possible intensification of the present extremely serious competitive situation with other building materials.

### COMPETITIVE PRODUCTS

The increasing difficulty of operation now and the increased competition of nonceramic products later will force all structural clay products producers to reduce all production costs and to develop improved or new products which will be better fitted for future markets.

Nearly all of the plants are old and most of them have been operated only intermittently during the past twelve years. Many of them cannot operate profitably until they have been extensively re-equipped and rebuilt. In the past, much of this rehabilitation has been done so haphazardly that the large expenditures for new equipment and new buildings have not produced commensurate improvements in operation.

### THE RESEARCH PROGRAM

An extensive program of research should be undertaken to enable structural clay products producers to so rebuild and re-equip their plants or to so change the operating technique of their present equipment that they can manufacture clay products which can be sold in all available markets on a profitable basis. This research program should include (1) detailed studies of raw materials, machinery, and equipment, fuels of all kinds, and processes of manufacture, and (2) the development of improved and new products and more efficient methods of promotion and distribution.

*Raw Materials and Equipment.*—The investigation of raw materials should cover the fundamental properties of various clays and shales and their behavior during the different processes of manufacture from digging and grinding through forming, drying, and firing the ware. This should be coordinated with an extensive study of the mechanical and ceramic processes involved and the machinery, equipment, power, and fuel needed to carry them on.

*Processes.*—Extensive and comprehensive research will be required to over-

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come losses in the drying, firing, and handling of structural clay products due to spalling, breakage, and discoloration. These defects, usually caused by impurities in the clay or strains set up during forming of the products, result in lamination, popping, scumming, or efflorescence.

*Products.*—The physical and architectural properties and uses of structural clay products now produced and the similar properties of competitive materials now on the market, including particularly comparative methods and costs of distribution and installation, should be studied. This investigation would determine the relative desirability of present clay products for the various markets and would point out improvements in present products. New methods of construction and new units of fired clay of different shapes or sizes and probably decreased weight should then be developed so that complete walls and structures can be built more cheaply with the same or increased architectural attractiveness. Methods of promotion and distribution should be improved and the cost of installation should be decreased so that old and narrowing markets can be developed and expanded and new markets can be opened over far wider areas.

*Program.*—Scientific research necessarily requires a great deal of time. Some of the results of comprehensive and fundamental research may not be used immediately by clay products producers to change their methods of manufacture or to develop new or improved clay products. Such research may not appear to have any immediate significance or application, but it constitutes a valuable reservoir of information to be drawn upon as needed. This information should be thoroughly studied and correlated with all available data and then tried out under actual manufacturing conditions until practical applications have been determined. It is important, therefore, that the research be undertaken very soon, so that the resulting information will be ready to aid the industry through the changes that lie ahead.

Such a program of research will require extensive facilities and many skilled technical experts working for many months. The services of professional research organizations would be too expensive. Other ceramic industries, such as the glass, enamel, and refractories industries, are carrying on extensive research programs because they have relatively few producers with large plants and sufficient resources. The structural clay products industry, however, is greatly decentralized. Many of its plants are small and have suffered from insufficient business for a long time. The resources of many producers are therefore entirely inadequate to finance such a program individually.

*Personnel.*—A large portion of this program could be undertaken in a relatively short time with the cooperation of ceramic engineering schools, university engineering experiment stations, the National Bureau of Standards, the U. S. Bureau of Mines, and the state geological surveys. A central executive body would be needed to (1) plan the program, (2) make the cooperative arrangements with the various research organizations, (3) supervise and coordinate the work, and (4) interpret and apply the results obtained from the various clay plants serving as "pilot" plants. This research program should be planned and undertaken, not as a temporary effort, but as a permanent part of the industry.

## CONCLUSIONS

The manufacturers, distributors, and sellers of structural clay products and those who furnish materials and equipment for their manufacture are all vitally interested in the welfare and future of this industry. They should therefore all share in the promotion and support of this research program.

Only through such an extensive research program, supported by structural clay products producers, distributors, and materials and equipment suppliers, can this industry survive the period of war restrictions and take its rightful place in the period of greatly increased competition which will follow.

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