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PROCEEDINGS  
of the  
FOURTH INTERNATIONAL CONFERENCE ON THE EFFECTS OF  
ALKALIES IN CEMENT AND CONCRETE

Purdue University  
West Lafayette, Indiana  
June 4 - 7, 1978

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Photomicrograph of a fracture plane through 52-year old concrete from a dam in Alabama, U.S.A.

- (A) Cross section through an entrapped air void that became filled with alkali-silica reaction gel. The gel shows a thin translucent outer zone and a white inner zone.
- (B) Sandstone coarse aggregate particle showing a reaction rim that formed at the contact with cement paste but is absent at the contact with the gel-filled air void.
- (C) Quartz sand grain with reaction rim.
- (D) Sandstone coarse aggregate particle with reaction rim.

Photograph courtesy U.S. Army Engineer Waterways Experiment Station.

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## FOREWARD

As indicated by the title, these Proceedings record the papers presented at the fourth in a series of international conferences devoted to the effects of alkalies in cement and concrete. Of primary concern at these meetings are the potentially deleterious effects of the reactions between cement alkalies and certain aggregate components, the well-known "alkali-aggregate" reactions. In an era in which the alkali contents of cements are increasing throughout the world, these reactions are of progressively increasing practical concern. Previous conferences in this series were held in Copenhagen in 1974, in Reykjavik in 1975, and in London in 1976. The proceedings of the 1975 meeting are available from the Building Research Institute, Keldnaholt, Iceland; those of the 1976 meeting are available from the Publications Department, Cement and Concrete Association, Wexham Springs, Slough GL3 6PL, England.

We are grateful to the National Bureau of Standards, the U.S. Army Research Office, the U. S. Department of Energy, and the Portland Cement Association for financial support of the Conference and for their encouragement. The Portland Cement Association was host to a final informal session of the Conference at its Research and Development Laboratories, Skokie, Illinois on June 8, 1978.

In the interests of early publication and rapid dissemination of the information presented at the meeting no technical editing was attempted and the papers published herein are reproduced, with few exceptions, exactly as furnished to the Conference. Thanks are due to Dr. Bryant Mather who compiled the material for publication and to

Mrs. Harriet Diamond for her assistance. Mr. Gary Lee, Associate Director of the Purdue University Division of Conferences acted as conference coordinator and saw the manuscript through its final publication stages.

We are grateful to the authors for their prompt submission of manuscript material, and hope that this publication will be of interest and utility to all concerned with the effects of alkalies in cement and concrete.

Sidney Diamond  
Conference Chairman

West Lafayette, Indiana  
October 15, 1978

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