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Four papers were presented at the session.

1. Dr. Figg stated the fact that for what concerns the control of alkalis in concrete the same communication difficulties exist between scientists and engineers, as in many other fields of science and engineering. Dr. Figg went on to present a very educational paper on materials science aspects of alkali-silica reactions which may enable all interested parties to communicate more efficiently.

2. Dr. Poole said that as a result of interaction between engineers and scientists much practical and useful information can now be provided concerning the factors which control alkali-silica reactions and the tests and limits which may be specified to avoid the use of reactive materials in concrete. However, at the present time, careful and intelligent interpretation of the research and test results is required, with all the probabilities duly considered, so that both unjustifiable expense and unjustifiable risk conditions can be avoided. According to Dr. Poole there is an urgent need for education concerning the interpretation and application of these results. Dr. Poole suggested that such education best could be accomplished in short courses and conferences where adequate opportunity exists for discussion.

3. Dr. Idorn felt that most of the knowledge for an educational development is at hand, but that the difficult task is to create an integrated civil engineering and chemistry approach to a concrete engineering curriculum including better text books and supporting post-graduate research programs. Rather than being educated for a trouble shooting function Dr. Idorn felt that engineering students should be educated so that, for instance, they could better assist in making possible a profitable utilization of the energy, which is inherent in the hydration activation with alkalis.

4. Mr. Rosendahl felt that new and intensified research is not the only activity needed at the present time. Much valuable knowledge is already available today, but remains more or less unused because of insufficient and uncoordinated education and lack of communication within the established construction industry. Mr. Rosendahl went on to outline an effort of a committee on the durability of concrete structures under the Danish Academy of Technical Sciences for the purpose of establishing an official education for concrete craftsmen in Denmark as well as of improving technical educations on all other levels.

The chairman called attention to the fact that there was general agreement among the four speakers that scientists and engineers cannot communicate efficiently when it comes to discussing effects and control of alkalis in concrete. The chairman felt that it is difficult for any one person to have the collective theoretical and practical background to design a comprehensive course in concrete engineering. This might be the task of professional societies, which could appoint committees with joint scientific and construction experience in order to provide the necessary interfaces in a unified concrete engineering education. This would be desirable not only for what concerns alkali-silicate reactions but for many other aspects of concrete technology. This has been treated further in Ref. / 1 /.

REFERENCE

/ 1 / HANSEN, TORBEN C.: Towards a Unified Engineering Education in Concrete Technology. CEB-RILEM International Workshop "DURABILITY OF CONCRETE STRUCTURES", May 1983, Technical University of Denmark, SPECIAL PUBLICATION. In press.