

## BOOK REVIEW

### Nordic Concrete Research

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**REFERENCE:** *Nordic Concrete Research*, Publication 4, The Nordic Concrete Federation, Oslo, Norway, 1985, 193 pp.

Palle Nepper-Christensen, Chairman of the Research Committee of the Nordic Concrete Federation, in the Preface, notes that this is the fourth "annual compilation of selected papers on concrete research projects which are being carried out or have been concluded during 1985 in the five Nordic countries: Denmark, Finland, Iceland, Norway and Sweden . . .," that it "contains a total of 13 reports on topics within the whole range of the concrete technique, i.e. from concrete technology to the design of reinforced concrete structures," and that "It is the hope of the Research Committee that this issue, as has been the case with the previous issues of NCR, through its presentation in English language, may act as a link between concrete scientists in the Nordic countries and the rest of the world."

Copies of all four compilations so far issued, 1982 through 1985, are available from: Norsk Betongforening, Kronprinsensgt. 17, N-0251, Oslo 2, (Phone No. 472/41 87 35), for NOK 150 plus postage. Publication 2 was reviewed in CC&A, Vol. 7, No. 1, p. 53, by G. M. Idorn; No. 3 was reviewed by me in CC&A, Vol. 8, No. 1, p. 52.

No. 4 includes 13 papers, all in English: (1) Hans Henrik Bache, "Durability of Concrete Fracture Mechanical Aspects," (2) Kajsa Byfors, "Carbonation of Concrete with Silica Fume and Fly Ash," (3) S. Chatterji and Z. Fordos, "Effect of Fly Ash Addition on Alkali-Silica Expansion," (4) Kirsten Eriksen and Per Just Andersen, "Foam Stability Experiments on Solutions Containing Superplasticizing and Air-Entraining Agents for Concrete," (5) Tor Arne Hammer, Magne Maage, and Andrzej Tomaszewics, "The Properties of Concrete Reinforced with Melt-Extracted Steel Fi-

bers," (6) Carolyn M. Hansson, Hanne Strunge, Jacob B. Markussen, and Thomas Frolund, "The Effect of Cement Type on the Diffusion of Chloride," (7) Tauno Hyvonen, "Brittleness and Strength of Reinforcing Steel Bars Under High Loading Rate at Lowered Temperatures," (8) Jukka Jokela, "Experimental Study Concerning Reinforced Concrete Beams under Thermal and Mechanical Loads," (9) Lauri Kivekas and Charles J. Korhonen, "Brittleness of Reinforced Concrete Structures Under Arctic Conditions," (10) Kjell E. Loland and Odd E. Gjorv, "Ductility of Concrete and Tensile Behavior," (11) Per-Ake Olsson, "A Fracture Mechanics and Experimental Approach on Anchorage Splitting," (12) Thorkild H. Rasmussen, "Long-Term Durability of Concrete," (13) Steve Svensson, "Diaphragm Action in Precast Hollow-Core Floors."

One useful feature, that could be adopted by publishers of such compilations to the benefit of readers, is an alphabetical list of names and addresses of authors.

The first paper, by Hans Bache, extends, to all forms of deterioration of concrete, the same elegant treatment that he and Isen described in their paper on popout formation in the *Journal of the American Concrete Institute* in 1968 (Vol. 65, p. 445), an article I frequently cite. Looking at concrete durability as an arena in which fracture mechanics principles are the rules of the game will increase insight and understanding.

The sixth paper by Carolyn Hansson et al. addresses diffusion of chloride into concrete, which is regarded by many in the United States as the current most serious problem in durability of reinforced concrete structures. They conclude that: (1) the greatest factor affecting chloride diffusion is water:cement ratio and (2) that tricalcium aluminate ( $C_3A$ ) is less effective in reducing diffusion than has been suggested.

Other readers with other interests will find papers of greater interest than these.

The quality of the work and of its presentation is high. Those who are interested in any of the 13 topics dealt with should look up the relevant papers.