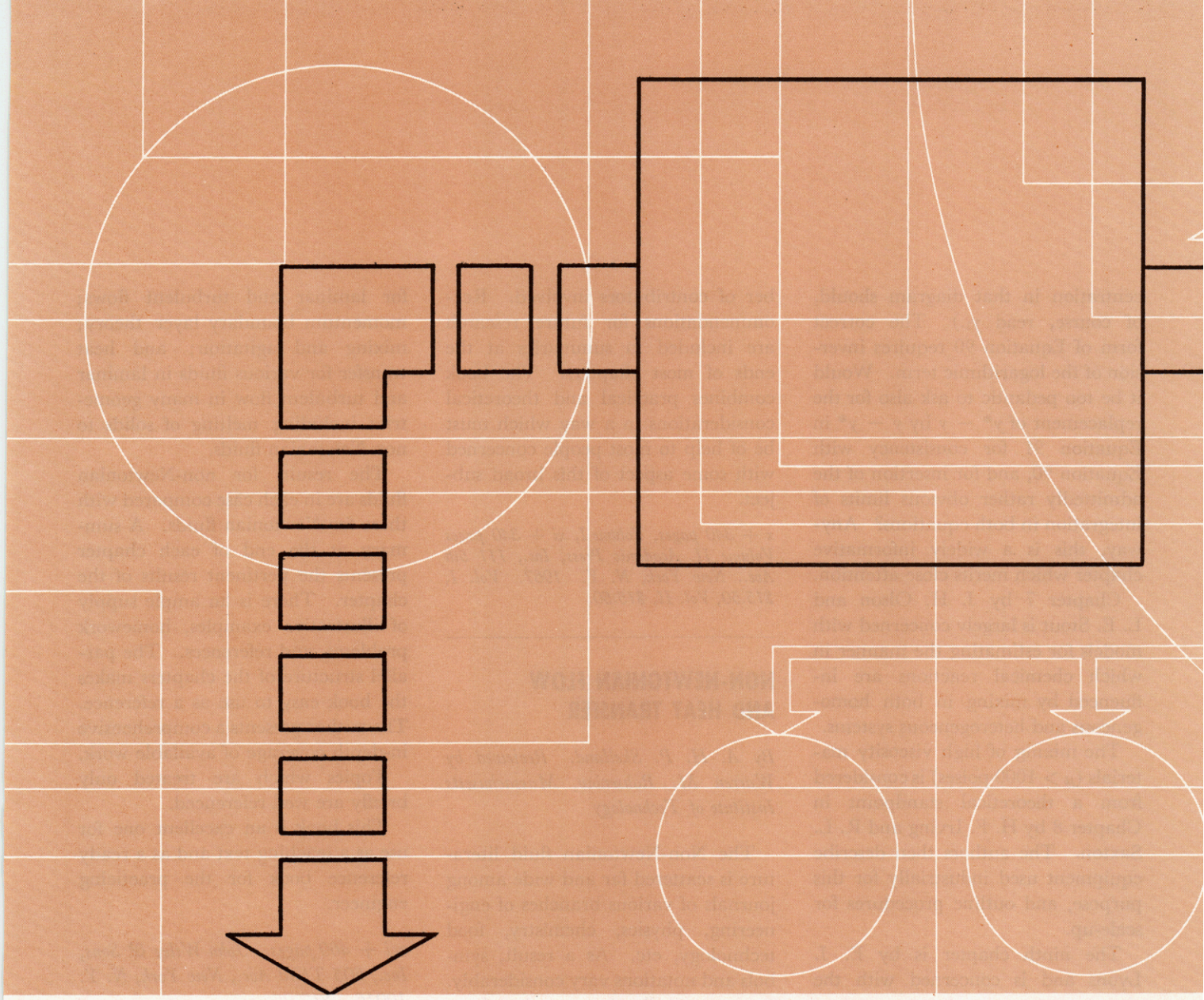
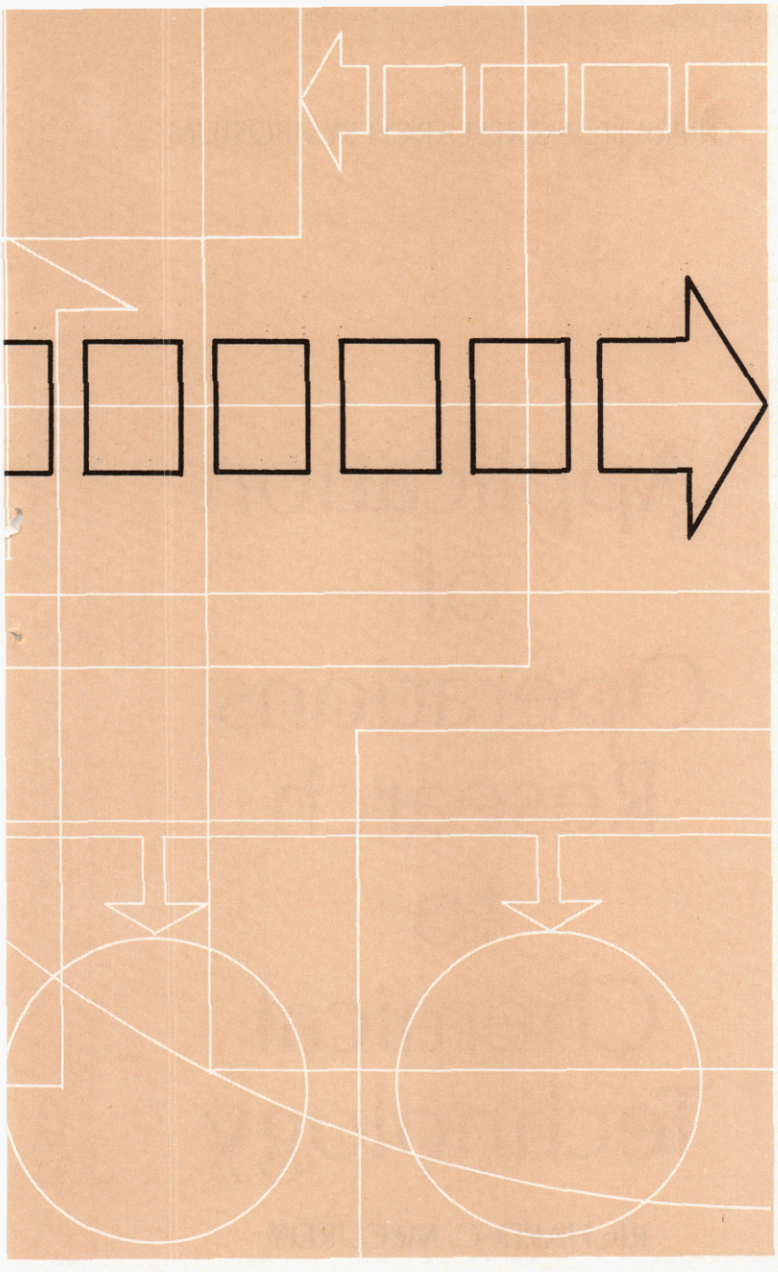


OPERATIONS RESEARCH SYMPOSIUM

DOUGLASS J. WILDE

In this issue appear seven papers presented at an international symposium on Applications of Methods of Operational Research to Problems of Chemical Technology organized jointly by the American Chemical Society and Dechema, the German Society of Chemical Engineering, in Frankfurt am Main in June 1967. The symposium reflects a growing European interest in operations research (or operations analysis), which has established a firm beachhead in the American chemical industry in the past 10 years. While the definition of operational research as "the rational application of quantitative methods to problems of planning and decision making" (R. C. McCurdy, President, Shell Oil Co.) would satisfy most practitioners, one cannot help observing that any successful chemical application involves a large portion of straight chemical engineering heavily flavored with the theories of probability, optimization, and control. Thus, in the chemical industry, operations analysis often is carried out by experienced chemical engineers having special mathematical skills rather than by professional operations analysts with little process knowledge. While there remains much controversy over



An Introduction to the Symposium on Operations Research sponsored jointly by DECHEMA and the ACS Division of Industrial and Engineering Chemistry, held in Frankfurt, Germany, in June 1967

what the company group doing operations analysis should be named, or whether it even should have a separate identity, there appears to be agreement on the usefulness of the function itself.

The symposium title emphasized *applications*, but few companies like to tell their competitors about successes, and no operations analyst wants to publicize his failures. Hence the technical papers tend to be more speculative than practicing engineers would like. Fortunately, Dechema was also able to attract the plenary paper, published with this collection, of R. C. McCurdy of Shell Oil on his company's experience with operations analysis. His frank exposition points out where immediate returns can be expected—e.g., process improvement—as well as where more basic research is required—e.g., capital allocation.

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By a not surprising coincidence, the technical papers tended to tackle the unsolved or partly solved problems pointed out by McCurdy. R. P. King (South Africa) discussed a problem of short-term scheduling involving maintenance of a paper machine subject to random failures of its components. Thiriet and Deledicq (France) showed how one might locate warehouses, taking account of exterior qualitative restrictions such as public relations that are difficult to put into a mathematical model. Beightler and Meier (U.S.A.) and Wilde (U.S.A.) all studied inventory control, the former using optimization theory, the latter control theory. These articles strengthen operations analysis precisely where McCurdy points out weaknesses.

Other papers in the symposium concerned problems that, as McCurdy confirms, have been solved and have consequently found wide application. The only one of these articles appearing here is that of Komatsu (Japan), who showed by example how linear dynamic analysis can be used to analyze a large, complicated hydrodealkylation process. The German papers, not translated here but appearing in *Dechema Monographien*, reflected wide use of critical path planning (Kast, Schulte), process modeling (Kobelt), and engineering economy (Seliger). Smith (U.S.A.) described application of evolutionary operations to improvement of a biological production process, and Heath (England) discussed warehouse location problems.

The remaining article presented here, by Heitman and Harris (U.S.A.), shows how much the high speed computer has brought together chemical engineering and operations research, for statistical error propagation analysis is used to construct a computer program for estimating physical properties of chemicals. Just as success in chemical operations analysis requires good engineering, so does good engineering need methods developed by the operations analysts.