

2. What we have said above sufficiently answers the second objection, but it may further be pointed out that a proper mathematical analysis can evaluate the effect of the errors that there will be in the estimation of constants. It can also suggest ways in which these constants may be determined more accurately and prescribe confidence limits for them.

3. Nowhere is the need for rigorous mathematical theory better seen than in the present day use of the computer. Without an existence theorem there is no assurance that the numbers ground out by the numerical solution of an equation have any meaning. There may be some intuitive presumption of their meaningfulness but let this be honestly recognized. The particular virtues of the digital computer are its speed, "careful attention" and "indefatigable assiduity"⁷. These may be exploited, but they need also to be controlled by a rationality which is too easily sacrificed in a culture which appreciates it so superficially. It is seldom wise and never desirable to start computing before obtaining a good qualitative feel for the form of a solution; the ability to do this is one of the fruits of mathematical training.

We therefore conclude that there is a valid place for theoretical and mathematical studies in chemical engineering research, provided that their virtues and limitations are properly understood and held in balance. When unwarranted

claims or unnecessary derogations are made from either direction, then the whole temper and spirit of natural philosophy is vitiated. Better soap may be made, but better living is not attained if cleanliness has become the first rather than the second virtue.

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Dr. Rutherford Aris was born in England in 1929, studied mathematics in the University of Edinburgh and taught it to engineers there. He has degrees from the University of London (B.Sc. (Math); Ph.D. (Math. and Chem. E.); D.Sc.). He worked a total of seven years in industry, but since 1958 he has been in the Chemical Engineering Department at the University of Minnesota enjoying the liveliness of its interests, both technical and cultural, and endeavouring to contribute to this vitality and communicate it to his students.

Summer School for Teachers of Chemical Engineering which was held at Michigan State University last June. For that reason, we have on hand a certain amount of material that will be published during the year. But we would also like to include in each issue one or two articles on chemical engineering education that have been submitted to us by people in the universities and in industry. Accordingly, your contributions are definitely solicited.

CHEMICAL ENGINEERING EDUCATION wishes to provide something of interest to the entire profession: educators in the university and engineers in industry; the large graduate-oriented departments and those with small undergraduate programs; the theoretically-inclined and the practice-oriented; chemical engineering professors and chemical engineering students. But while we

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Ray Fahien