A.I.Ch.E. JOURNAL

Nuclear Engineering and the Unit Operations

This issue of the A.I.Ch.E. Journal is devoted in large part to certain papers presented at the Nuclear Engineering and Science Congress in Cleveland, Ohio, from December 12 to 16, 1955. Only a relatively small number of the papers presented at Cleveland can be given here, but an attempt has been made to include most of those which appeared to be of greatest appeal to the readers. This is the first issue of the Journal in which there has been a concentration on one particular and rather limited aspect of chemical engineering. It is hoped that it will be successful and that there will be many more special issues as the publishing program expands.

Nuclear engineering has come to the fore in recent years at a rate far exceeding that at which any other branch of engineering has advanced. In view of the necessary secrecy attending its development and a rather restricted publication policy, this speedy progress is all the more remarkable. There are many reasons for it, of course, among which are the vast financial backing of government, the promise and prospect of a new and potentially enormous source of energy, and the appeal of its startling novelty. Also, the possibility that the standard of living throughout the world may be significantly increased has kindled special enthusiasm among nuclear scientists and engineers. However important such reasons may be, this enormous progress of nuclear engineering could not have occurred through them alone. The basic source of strength behind this wonderful achievement is, in the opinion of the editor, the good preparation of our engineering profession and the fact that we were ready for this development.

When one reads the papers of this issue of the Journal, he is compelled to recognize the brilliance of the invention of the unit operations. While a few papers are devoted to the technology of nuclear engineering, the majority of them are simply the application of our unit operations—heat transfer, fluid flow, diffusion, and the like—to a new problem. It is inconceivable that William H. Walker and Arthur D. Little could have visualized this whole field of nuclear development when the idea of unit operations was born, but what greater tribute to their invention can be found? We must also acknowledge the contribution of teachers of chemical engineering, particularly the earlier ones, and the writers of text books who recognized the great merits of this idea and who gave it the wide currency enjoyed today. The concept of unit operations is still the backbone of chemical engineering education, and it is a very sturdy one.

Today nuclear engineering can be advanced and brought to a point of extraordinary achievement through unit operations. Tomorrow it may be the utilization of solar energy, the gasification and liquefaction of coal, the direct conversion of fossil fuel to electric energy, or the demineralization of sea water to which we must apply ourselves. But whatever it is, we shall find, as we have here, that the application of unit operations to the problem will be enormously fruitful.

We chemical engineers may feel justifiably proud of the Nuclear Engineering and Science Congress and of the part played there by individuals and by the American Institute of Chemical Engineers. Most of all, however, we should take pride in the profession itself, in the educational philosophy which has done so much to give substance and vitality to our work, and in the demonstrated ability of our professionals to apply themselves so successfully to the new and wonderful field of nuclear engineering.

H.B.