

## *Design Versus Research?*

The engineering college curricula of the past tended to be narrow, functional, and specialized and the students were sequestered. Nevertheless, the engineering graduates, building upon the limited theory available to them, designed and built a great industrial complex in this country.

With the onset of World War II the engineering profession began to realize that the training was not adequate, that the profession was unable to cope with the new rigor required in the engineering procedures and designs. There occurred a renaissance of engineering education, with a greater emphasis on mathematics, physics, and other fields of science. This revolution continues, with the very remarkable result that the new engineering has expanded its vistas, making original and developmental contributions in such varied areas as automation, space technology, medicine, and innumerable other fields.

Those who have been educated in the new school of engineering education accept easily and naturally the new role of the engineer, and travel with equal facility between design of plants and the derivation of fundamental equations in fluid mechanics. The new breed of engineer in his long education is exposed to both the analytical and empirical approaches to engineering, to the esoteric and the practical, to the dissection of a problem and the reconstitution of information into a working model. During his varied education, the engineering student is enabled to develop his latent aptitudes in analysis and synthesis; in the process he recapitulates and reenacts the evolution of engineering. The student is exposed to a wide range of engineering approaches, and with maturity makes an individual decision of preference reflecting his background and motivation.

Thus it would seem retrogressive if by conscious effort or otherwise there should be now a trend toward the splitting of engineering curricula into research and nonresearch (design) degrees. Most engineering departments are composed of faculty reflecting both the design and the research orientation. The competition and discussion between departmental faculty over the merits of the design or research approach are healthy and tend ultimately to introduce interdisciplinary concepts and an enrichment of the faculty and curriculum. The result is a strengthening of the engineering department. Efforts therefore to legitimize a design—research dichotomy by different degree designations such as masters of engineering seem to deny the interdisciplinary attitude at the origin and could lead to serious limitations on the advancement of the engineering profession. The plea now ought to be for less, not more, difference in degree designation within engineering and between engineering and other disciplines.

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