

arrival and service distributions, and the fourth on queue discipline, priorities, and other special cases. The bibliography is extensive.

The work by Takács is at the same time the most mathematical and the most unified logically of the four. It has all the formalisms dear to the mathematicians heart (but to no one else!) and no discussion whatever of the practical implications (or often even of the meaning) of the formulas that fill its pages. Yet I believe it will be a mine of useful technical suggestions for those queuing specialists with sharp picks and strong shovels. It deals in turn with the single-server, then the many-server system, for different arrival and service statistics and with formulas for transient behavior as frequent as with those for steady-state. Telephone traffic problems are treated next, then machine repair, and finally the behavior of electronic radiation counters, devices that also have their congestion problems. Here, we are pleased to see, operations research has begun to repay physics.

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## A Productive Compromise

**A General Pattern for American Public Higher Education.** T. R. McConnell. McGraw-Hill, New York, 1962. xi + 198 pp. \$4.95.

Higher education in this country faces rapidly accelerating demands that arise from growth in population, the increasing percentage of college-age youth seeking collegiate education, and society's expanding need for professionally trained specialized manpower. In addition, universities are under mounting pressure to expand their research and technical services to help the nation meet its local, regional, national, and international responsibilities.

What kind of institutional structure for public higher education would best serve these needs? This is the essential question considered in this timely addition to an outstanding series of studies from the University of California's Center for Research in Higher Education at Berkeley, whose chairman, T. R. McConnell, is the author of the present volume.

Two major assumptions underlie McConnell's analysis: first, that the

problems created by the rising demand for higher education are not to be solved by making education more selective; second, that the brunt of expanding enrollment will be borne by public rather than private institutions. Although he recognizes the important role of private institutions, McConnell decided to limit this volume to a discussion of the structure of comprehensive, statewide systems of public colleges and universities.

With respect to selectivity, he thinks that, while shortages of facilities and staff might lead to short-range restrictions on admission, the long-run trend will be toward broadening the population base of higher education. Convincingly, McConnell rejects Havighurst's contention in a recent volume that declining occupational demand for people with college education will reduce, and perhaps even reverse, the trend of increasing enrollment. With John Gardner, McConnell believes that American society requires increasingly greater "training in depth"—involving many types and levels of talent—rather than a highly educated elite separated by a great intellectual gulf from "the meagerly educated masses."

The diversity of student attributes and the heterogeneity of social demands would seem logically to call for an appropriate division of labor among institutions of higher education—with universities, 4-year colleges, junior colleges, and technical institutes performing somewhat distinctive functions for typically different kinds of students. Instead, McConnell notes, the trend is toward convergence among institutions, with the 4-year colleges striving to become universities, junior colleges pressing to become 4-year institutions, and technical institutes trying to become comprehensive junior colleges. The striving for higher status in the institutional hierarchy reflects the attitudes and values of students, parents, faculty, and alumni—not to mention the economic and political interests of local and regional groups. The author's account of developments in California emphasizes the power with which such forces oppose plans for the division of responsibility among institutions in a statewide system.

Nevertheless, McConnell believes that the growing shortages of funds and staff, as well as the failure to provide the varied types and levels of education needed to meet the diverse needs of our complex society, will require some

form of statewide coordination among public institutions: voluntary coordination, compulsory coordination, or centralized operating control. His preference is for voluntary coordination, which seems to offer the best possibility for "productive compromise" between the values of autonomy (initiative, flexibility, experimentation, the quest for institutional excellence) and those of coordination (economy, improved specialization of function, better correlation between needs and programs).

Although many "state planners" of higher education will not find the evidence, to date, convincing, this view has the great merit of recognizing the dynamic, "dialectical" nature of the process of social change in a democratic society. Somewhere between the chaos of laissez-faire competition and the enervating rigidity of the legislated blueprint, an appropriate pattern for American public higher education will be found; McConnell, in this book, has made a notable contribution toward the identification of its essential character.

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## Precursors of a New Era

**The Correspondence of Isaac Newton.** vol. 3. 1688–1694. H. W. Turnbull, Ed. Published for the Royal Society. Cambridge University Press, New York, 1961. xviii + 445 pp. Illus. \$25.

In this third volume of the monumental Newton correspondence, we reach the years 1688 to 1694, when the *Principia* has been published and the hero has entered into his most diversified period. Here are letters from his life as a member of the Convention Parliament, his patient explanations to Samuel Pepys about the mathematical probability of throwing sixes at dice, essays on theology and chemistry, and material related to the famous episode of psychotic delusion when, amongst other things, he accused John Locke of attempting to embroil him with women and to sell him an office. There is perhaps more human interest and less mathematics in this volume than in the preceding two, but when one is dealing with a Newton, even the lesser items may be of the deepest interest.