Stochastic Service Systems, by John Riordan. Wiley and Sons Inc., New York, 1962. x + 139 pages. $6.75.

The mathematical theory presented here arose from problems in telephony, which is still its main customer, but it also applies to many situations in physics (e.g. particle counters), biology (birth and death processes, evolution, handling of information by the nervous system), economics (inventory theory, efficiency arrangements) etc. Roughly, in a stochastic service system there are one or more servers (possibly infinitely many), and a traffic imput: customers arriving at random times t_1, t_2, ... demanding service. The probabilistic description of the system consists, in the first place, of the distribution functions of $t_{i+1}-t_i$ (these differences are assumed to be identically distributed random variables), and of the length of time it takes to service a customer. When all servers are busy the new demands may be dismissed (loss system) or allowed to wait (delay system). In the latter case we may have the first-come-first-served rule, the last-come-first-served rule, or next service to a waiting customer selected at random. It may also happen that waiting customers defect according to some rule, before being serviced, and that there is some system of priorities. The assignment of free servers may be instantaneous or it may involve a time for orientation and identification. Of interest are probabilistic descriptions of: the number of lost customers (in a loss system), the waiting time (in a delay system), the number of busy servers, stationary state (in which the various probabilities are time-invariant) etc. Thus there is a very wide variety of problems; these are handled in six chapters: 1) Introduction, 2) Traffic Input and Service Distributions, 3) The Simplest Traffic System (infinitely many servers), 4) Single-Server Systems, 5) Many-Servers Systems, 6) Traffic Measurements. The mathematical tools are classical: difference, differential and integral equations, Laplace Transforms, generating functions. The book, although technical, is clearly and attractively written, and may be read profitably by anyone acquainted with the elements of probability (although some knowledge of stochastic processes and gueing theory would be an advantage). There is an index and a five-page bibliography.

Z.A. Melzak, McGill University

Management and the Computer of the Future, M. Greenberger (editor). M.I.T. Press and Wiley, Boston, 1962. xxvi + 340 pages. $6.00.

In celebration of M.I.T.'s centennial, a series of evening lectures took place, bearing the title of this volume. These lectures together with panel and general discussions are here reproduced. The speakers and discussants came from many different fields:

Computer experts, electrical engineers, mathematicians, industrialists, psychologists etc. The result is what one may expect from such an interdisciplinary symposium: Informative lectures are mixed with after-dinner-type speeches, and it is not always easy for the non-expert to tell the difference. However, the book is easy to read, almost like science fiction. The reviewer cannot resist the temptation to repeat here some quotable statements:

N. Wiener: Let language translating machines learn grammar by doing exercises and having them corrected.

J. G. Kemeny: Many librarians have discovered that if a book is misplaced on the shelves and cannot be located after a short search, it is less costly to replace it than to find it.

Anonymous: European rats solve problems by insight, American rats solve problems by trial and error.

J. R. Pierce: Wang's program has enabled the I. B. M. 704 computer to prove all 350 theorems in the first 13 chapters of Principia Mathematica in 8.4 minutes.

Several of the speakers envisaged the future as a kind of symbiosis between man and computer. Mathematicians will probably be interested in Kemeny's proposal to meet the threatening library explosion by a single, centrally located, automated library. A vast electronic computer will aid readers throughout the country simultaneously in their search for information. We are all familiar with the references at the end of a research paper, they enable us to find related material in the past. Under Kemeny's system it will be possible to extend this search into the future: One quickly finds all papers which quote a given paper. Better still, one finds out from the central computer which papers have been consulted by which mathematicians. This will undoubtedly add another dimension of debatable desirability to mathematical research. But perhaps Kemeny is altogether mistaken about the library of 2000 A. D., and information will be stored not on magnetic tapes, but on clay tablets.

J. Lambek, McGill University

Numerical Analysis, by N. Macon. John Wiley and Sons, Inc., New York, 1963. xiii + 161 pages. $5.50 U.S.

As the author points out in his preface, the book is designed for a one-semester first course in numerical analysis or as a volume for independent study by one who wishes to grasp the rudiments of the subject. The author also points out that the book requires only a knowledge of freshman mathematics and calculus, as exemplified

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