treatments are then combined in the familiar matrix form of Gauss' method. This lengthy discussion will probably be appreciated by the non-mathematician not too accustomed to matrix manipulation.

The least-square polynomial fitting problem is furthermore discussed in the case of a large number of data, where these observations are divided into a number of groups. The mean value in each group is then treated as a single observation. Attention is firstly given to equally-spaced observations of equal weight, and secondly to the general case when the spacing is non-uniform. Here the author investigates the questions of efficiency and bias in an interesting manner.

A short chapter is devoted to the non-polynomial fitting problem which so often materializes in practice. This is the case where we have a tabulated function of several variables which is to be approximated (in terms of least-squares) by a linear function of these variables. The non-linear case is linearized (due to W. Deming) by a change of variable or by using approximation methods based on a Taylor's series expansion.

The book concludes with five examples illustrating the commonest types of curve fitting problem; i.e. the straight line, the polynomial, the polynomial with equally-spaced observations, the linear function, and the non-linear function. The author also provides a useful guide to the more commonly used calculating schemes so as to assist the computor in selecting a method best suited to a given problem.

This book should prove interesting and of great help to the physics student or other research worker whose experiments lead to a curve fitting problem. It is written in a very clear style, and only knowledge of the calculus is presumed. Sporadic use is made of just the very simplest matrix operations. Since the author wanted to "obtain a better balance between theory and practice", the work literally teems with numerical examples (mostly taken from problems in physics) which are worked out, complete with a full calculating scheme. These are designed for a desk calculating machine, but are also applicable to most automatic computers.

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Théorie Analytique des Problèmes Stochastiques Relatifs à un Groupe de Lignes Téléphoniques avec Dispositif d'Attente, by F. Pollaczek. Mémorial des Sciences Mathématiques, Fascicule 150, Gauthier-Villars, Paris 1961.

This monograph discusses the stochastic problems associated with a system consisting of $s \geq 1$ telephone channels; the author has considered some of these in a series of papers published in the Annales de l'Institut Henri Poincaré, and in the Comptes Rendus de l'Académie des Sciences over the past 16 years. His previous monograph (Mém. Sc. Math. Fasc. 136, Paris 1957) has been concerned with the particular case of $s=1$.

The problems which arise in the distributions of waiting times are reduced to the solution of a system of s simultaneous linear integral equations. These hold subject to the simple condition that the mean service time for a call is finite, the distribution function $f_2(t)$ of the intervals between consecutive calls being arbitrary. The integral equations are partially solved for any integer s when the service time distribution is negative exponential.

It is shown that they can also be solved for the two particular cases where 1) the Laplace-Stieltjes transform of the service time distribution is a rational function, $f_2(t)$ being arbitrary, and 2) the Laplace-Stieltjes transform for the distribution of intervals between calls is a rational function, the distribution function for service times being a step function. The method of solution is illustrated for $s=2$.

The reader concerned with developments in stochastic processes will find this monograph of great interest, the more so because of its original approach to the waiting time problems discussed.

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<u>Summation of Infinitesimal Quantities</u>, by I. Natanson. Hindustan Publ. Co., Delhi 1961; published in America by Gordon and Breach, Science Publishers, New York 1962. 74 pages. $4.50.

This is a useful and well-written book intended for the pre-calculus student, and concerned with presenting and applying the fundamental idea of the integral calculus.

The author develops and uses the formulae

$$\text{(A)} \quad \sum_{k=1}^{n} k = \frac{n(n+1)}{2}, \quad \sum_{k=1}^{n} k^2 = \frac{n(n+1)(2n+1)}{6}, \quad \sum_{k=1}^{n} k^3 = \frac{n^2(n+1)^2}{4}$$

to establish a surprising variety of results usually obtained in elementary calculus. This is achieved using only the simplest idea of the limit process.

The technique is extended in two ways. First, by computing