Formulas (Prentice-Hall, Englewood Cliffs, N.J., 1966. 384 pp., illus. $14.95), by A. H. Stroud and Don Secrest, is to give persons who engage in approximate integration on a digital computer extensive and indispensable tables of quadrature formulas. The general properties of Gaussian quadrature formulas are introduced in the first chapter. Gauss-Jacobi, Gauss-Laguerre, and Hermite formulas are presented in the second chapter. Fortran programs for computing general Gauss-Jacobi and Gauss-Laguerre formulas are also given. A very good discussion of the various uses of the tabulated formulas (for example, for the construction of product formulas for multiple integrals) and their error bound in various applications follows. For most of the formulas, tables of error coefficients, which enable the reader to compare Gaussian formulas with simpler formulas such as the trapezoidal rule, are also included. The fifth chapter contains a complete survey of other existing tables, and the sixth gives tables of orthogonal polynomials. On the whole, the presentation is clear and careful throughout. The information is up-to-date and complete. Researchers will find the book a convenient and useful reference.

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Medical-Care Legislation in Britain

In **Doctors and the State: The British Medical Profession and Government Action in Public Health, 1870–1912** (Johns Hopkins Press, Baltimore, 1965. 323 pp., illus. $7.95) Jeanne L. Brand presents a well-documented and scholarly study of an awakening of social conscience in England. Although the House of Commons passed old-age and sickness insurance bills for the "labouring poor" in 1773 and in 1789, the bills were vetoed by the House of Lords. The slow development that preceded passage of the first national health act in 1911 exhibited much of the unenlightenment and selfishness that so frequently resist attempts to improve public health and welfare. The ignorance and bigotry of lay bureaucrats suppressed expert medical advice, medical health officers were unwilling to enforce sanitation measures, and individualism conflicted with central authority. There was opposition by fanatics (George Bernard Shaw against vaccination), and the principle of "deterrence," according to which every pauper was a malingerer, was accepted by many. A suggested rehabilitation of unfit homes was denounced as communism; and "too much help destroys habits of thrift and industry."

In spite of all these obstacles, there was slow but steady progress in sanitation and elimination of unhealthy housing and pollution of streams and air. Sanitary sewage disposal and the introduction of safe drinking-water came about after painful delays. Vital statistics, including compulsory reporting of infectious diseases and deaths, were finally introduced. The forces that did most to promote these advances were tragic epidemics of cholera and smallpox, the efforts of courageous members of the medical profession, and the first real recognition that diseases caused by bacteria were preventable. Medicine was usually far ahead of public opinion. Effective legislation came even more slowly. *The Lancet* in 1871 predicted bitterly, "The future historian will record with wonder that the men of the Victorian age would meet and write, and agitate, and petition in order to save one murderer from the gallows, while at the same time they suffered honest citizens to die like rotten sheep rather than pass a law to prevent the dealers in drinking-water to adulterate it with sewage."

Concurrent with these advances in public health and sanitation was the growth of concern with individual health and with the role of curative as well as preventive medicine. The medical care of the destitute was run as part of the poor-law system, with incredible disregard for human values. This was in large part due to bureaucritic lay control. Requests of physicians for extra nutrition for very sick patients were refused, medical officers were poorly paid, and scientific progress was ignored: for example, it was not until 35 years after the introduction of anesthesia that its use was permitted in the poor-law system. There was over these decades an increasing use of the insurance principle for covering the cost of illness by clubs and the so-called friendly societies, but the quality of medical care provided by these societies, as in the workhouses, was poor to scandalous.

In 1899, the British Medical Association rejected a "state department of curative medicine" as being "unnecessary and undesirable," although that association was active in pushing general public-health measures. However, the scientific advances in medicine made the possibility of cure more and more likely, and the increasing influence of the working classes created demands for medical care, backed now by the political power of the Labour Party. There was growing dislike of restricting medical relief to the technically destitute.

A Royal Commission on the Poor Laws and the Relief of Distress was appointed in 1905. Although medical repesentation was considered inadequate by the British Medical Association, a relatively thorough study was made and majority and minority reports were offered. The defects in the medical service provided under the poor laws were admitted by all, but the majority urged that medical assistance not be made "so attractive that it may become a species of honourable and gratuitous self-indulgence." The minority report, though it warned against tempting citizens to range themselves among the destitute, "yet recognized a corporate duty for treatment of those that needed it"; "social health is a joint responsibility of the individual and the community."

The National Insurance Bill was presented to Parliament in May 1911 by Lloyd George. It was a relatively far-reaching scheme with the novel aspect that participation was compulsory. There was practically no consultation with the medical profession in its construction. The British Medical Association made many demands for revision, largely on matters of control and financial return, and spent £53,000 on its campaign against the bill. But the response of the British Medical Association did not compare with the bitterness and distortions that have characterized the American Medical Association's fight against government health acts in the United States.

One realizes with surprise how inadequate this first National Insurance Act was. It covered essentially the adult male wage-earner for short-term risks, with no provision for major surgery, x-ray, or general hospital services. There were some sickness insur-

ance and maternity benefits. For the first time, a routine contribution to medical research was offered (one penny per insured person). The Act was greatly modified and increased in coverage in subsequent years.

It is entertaining and instructive to read this careful study in the light of our present initiation into Medicare. The excellent series of articles on the events leading to the passage of the Medicare bill published in July of this year in the *New Yorker* offers an interesting contrast to the material in this book.

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Anaerobic Microorganisms

André Prévot's *Manuel de Classification et de Détermination des Bactéries Anaérobies* has been an essential reference book for microbiologists ever since the first edition came out during World War II. The second French edition of 1948 and the third of 1957 incorporated changes rendered necessary by work carried on in the intervening years. The first American edition of **Manual for the Classification and Determination of the Anaerobic Bacteria** (Victorien Fredette, Transl. Lea and Febiger, Philadelphia, 1966. 402 pp., $15), which has just been published, is primarily a translation of the third French edition but incorporates changes in taxonomic arrangement. It includes 50 genera and about 500 species, 56 of which are new.

The fundamental advantages of Prévot's system of classification of the anaerobic bacteria are retained. This unified approach to all of the obligately anaerobic bacteria offers advantages to the microbiologist seeking to identify an unknown organism, and the use of only morphological characteristics to designate genera allows any strain to be placed within a genus. This feature is most appealing to the inexperienced worker, for there is a place for every organism; Prévot's strict adherence to the rules of nomenclature is likely to appeal to the classical taxonomist. That Prévot's system of classification has filled some real needs is shown by the increasing number of workers who use it, particularly for the non-spore-forming rods, the group that gives the most trouble and has had the least critical taxonomic work.

Nevertheless, this scheme of classification is not without difficulties, for while it is simple, application is not always easy. Closer attention than usual must be given to details of technique, for a minor variation in procedure or a slight misinterpretation of results may result in the selection of an incorrect genus. Also, daily observation and measurement, for several weeks, may be necessary to determine in which of two genera a strain should be placed.

Although genera in this system are characterized only on morphological characteristics, subgenera are established by several criteria. Some subgenera are established on the basis of physiological properties, others on the basis of pathologic changes produced in laboratory animals. Species differentiation is based on gas production, colony shape and color, nutritional requirements, and the classical culture characteristics long used by the microbiologist with any system of classification.

There have been many minor but few major changes from the third French edition. Two genera, *Fusocillus* and *Sphaerocillus*, have been removed, with the species formerly listed in *Fusocillus* having been transferred to *Zuberella*. The species formerly listed in *Sphaerocillus* have disappeared entirely. Some desirable changes have not been made. For instance, the clear establishment by recent workers of four distinct species in *Actinomyces (Actinoacterium)—A. israelii, A. naeslundii, A. eriksonii*, and *A. bovis*—has not been recognized.

Like almost all books, the *Manual* has its flaws. The publishers are to be complimented on producing a well-made book printed in highly legible type, well bound, and quite suitable for constant use in the laboratory. It is unfortunate, however, that careless proofreading has resulted in so many errors. The translation is exact but tends to be literal; for example "this genus groups presently 15 species" and "To revitalize the pathogenicity, nonspecific agents must alter the host's tissues." One also occasionally finds a puzzling statement such as that concerning *Cillobacterium endocarditis*, "The sterile filterate [sic] kills mice (intravenous injection) at 1 to 20 ml.," a massive dose for an animal that usually weighs between 20 and 30 grams. There are a few inconsistencies such as the statement in the preface that "*Fusiformis* cannot be considered as autonomous any longer but a subgenus of *Sphaerophorus* which brings together all the species with pointed ends," although in the text *Fusiformis* is listed as a valid genus in its own right with three former species having been transferred to *Ristella*.

Although few workers with the anaerobes will agree with every detail of this system of classification or with every species description they will, nevertheless, appreciate that this manual is the only book that endeavors to treat all the anaerobic bacteria by a single system, and that only a microbiologist with Prévot's decades of experience could have written it. It will find a place on the reference shelf of every laboratory concerned with the anaerobes and will undoubtedly fulfill the hope of the author "to bring closer together the taxonomic concepts of French and American bacteriologists."

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New Books

General

The Adventure of Man: His Evolution from Prehistory to Civilization. Arthur S. Gregor. Macmillan, New York, 1966. 192 pp. Illus. $4.50 (juvenile).

Ancient Oaxaca: Discoveries in Mexican Archeology and History. John Paddock, Ed. Stanford Univ. Press, Stanford, Calif., 1966. 432 pp. Illus. $18.50. Contributions by Ignacio Bernal, Alfonso Caso, Robert Chadwick, Howard F. Cline, Wigberto Jiménez Moreno, Howard Leigh, John Paddock, Donald Robertson, and Charles R. Wicke.

Ancient Peruvian Ceramics: The Nathan Cummings Collection. Alan R. Sawyer. New York Graphic Soc., Greenwich, Conn., 1966. 144 pp. Illus $8.50.

John James Audubon. Alexander B. Adams. Putnam, New York, 1966. 510 pp. Illus. $7.95.

Behind the Dim Unknown. John Clover Monsma, Ed. Putnam, New York, 1966. 256 pp. $4.95. Contributors are Russell C. Artist, Donald G. Baker, Paul G. Bartels, John A. Buehler, Wilbur L. Bullock, Clifford L. Burdick, Leonard F. Burkhart, Ralph F. Coleman, Lion F. Gardiner, Frederick H. Giles, Duane T. Gish, Terry F. Godlove, John J. Grebe, Dean Owen Harper, H. Harold Hartzler, George F. Howe, O. Carroll Karkalits, M. Joseph Klingensmith, William G. Pollard, Dwight L. Randall, Harold L. Slusher, William H. Van de Born, Laurence C. Walker, Kurt Weiss, Albert M. Winchester, and Merlin Wayne Zook.

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