The present volume, edited by T. W. Anderson and sponsored by the Institute of Mathematical Statistics, is a fine record of Wilks's work. It begins with a quite detailed biography and critique of his research. There follow 48 papers reproduced photographically from the original journals.

The 18 papers from the period 1931–1938 are theoretical contributions to statistics. The later papers are more varied. Some are mathematical, whereas others are concerned with applications of statistics, for example, to geology, to public opinion polls, and to the age distribution and mortality of resident members of the American Philosophical Society; this last study was commissioned to guide the policy of election. Yet other papers illustrate Wilks's concern with the broad problems of mathematical education.

There have been very big developments in mathematical statistics since the time when the main body of Wilks's theoretical work was done. It is a major tribute to the content and presentation of his work that the early papers remain interesting and relevant.

In addition to the widely known and commonly referred to papers, which nevertheless it is good to have collected together, there are a number of papers not previously readily accessible. It is likely that students, teachers, and research workers with an interest in statistics, theoretical or applied, will find something unfamiliar and of value in the volume, and it deserves to be widely available.

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Medical Entomology

Ectoparasites of Panama. RUPERT L. WENZEL and VERNON J. TIPTON, Eds. Field Museum of Natural History, Chicago, 1966. xii + 861 pp., illus. $25.

The variety and number of recently recognized arthropod-borne pathogenic agents afflicting man and other vertebrates can scarcely be encompassed by any single specialist. Moreover, newly discovered complex vector and reservoir chains and interplays of hosts, parasites, and ecological elements in pathogen-transmission patterns cause numerous textbook examples of arthropod-borne disease epidemiology to be suspect or incorrect. Disease investigation in many regions of the world is hampered by insufficiency of knowledge of hosts and parasites. Rarely in developing areas do workers in the diverse disciplines involved in epidemiological investigations have available, even in scattered form, faunal information as useful as that consolidated into this book, to which 20 recognized specialists have contributed important information on 360 ectoparasite species and over 200 mammalian host species found in Panama. The contents of the book demonstrate what an enormous amount of field collecting, data recording, and laboratory study is necessary for a preliminary biomedical understanding of even such a limited tropical area.

In the introduction, the environment and history of medical entomology in Panama are reviewed. A gazetteer of collecting localities is followed by a foldout map showing altitudinal contours and key localities.

Five chapters are devoted to some 42 genera (5 new) and 95 species (34 new) of mites. Laelapine mites, which "may fill key roles in epidemiological patterns that for the moment are confusing," include 8 genera and 19 species known to infest 33 mammalian species. Where only a single dermanyssid mite had previously been reported, 41 taxons infesting about 45 host species are recorded. Eight of 15 bat-infesting spinturncid mite species are described as new; all are first records for Panama. Chiggers numbering 76 species in 29 genera (16 new species and 5 new genera) were collected from some 5000 hosts representing about 70 mammalian, 50 avian, and a few reptilian species.

Of 47 tick species in 10 genera, 12 were previously unreported from Panama. Extensive host lists and comments on apparent host, altitudinal, and climatic preferences are included. Fifty-four instances of human infestation by 11 tick species are recorded. Epidemiological features of even such obvious tick-borne diseases as Rocky Mountain spotted fever, piroplasmosis, and relapsing fever remain to be studied in Panama.

A checklist of the 21 species of highly host-specific mallophagan lice known from Panamanian mammals, and of 17 other species that may eventually be found there, is included. Eighteen species of anopluran lice double the number previously recorded for Panama.

A new parasitic beetle in the family Staphylindae is described and another is recorded from Panama together with a new species from southern Mexico. These strange parasites of cricetine rodents represent primitive Andean elements in highlands of southern Mexico and Central America.

The text on fleas, which describes 37 species and subspecies, including 6 new species and 7 initially recorded from Panama, is followed by 40 fine plates. The tabulation is especially useful for host infestation percentage and male and female infestation of each host species in lowland, intermediate, and highland zones.

Three chapters are devoted to dipterous parasites. A short checklist of Hippoboscidae notes 6 species from birds and 2 from mammals. The nycteribiid bat flies treated consist of 5 previously unrecorded and 2 new species. A 270-page treatment of the streblid bat flies is based on several thousand carefully annotated Panamanian collections from more than 50 host species that provided over 10,000 streblid specimens, many with a high degree of host specificity, belonging to 66 species, 44 of them new. Certain other neotropical species are treated to enhance the overall taxonomic picture. Following a thorough account of techniques of streblid collection and specimen preparation are a section on morphology and some biological notes. The extensive systematic review and concluding discussion of host-streblid relationships are a significant contribution.

The chapter entitled "Some relationships between mammal hosts and their ectoparasites" is based on such extensive experience that it is must reading for all investigators concerned with host-parasite associations. An essay entitled "Mice, land bridges, and Latin American faunal interchange" presents a large volume and variety of information pertaining to the ancient and more recent factors affecting the composition and distribution of the Panamanian mammal fauna in relation to that of North and South America. Both of these chapters take issue with prevailing views on the role of the Panama water gap and the land bridge in the dispersal of mammals, especially the cricetine rodents, into South America. An annotated checklist of mammals is followed by an appendix in which host species are listed together with the species of their ectoparasites.

Carefully constructed keys are provided for Panamanian species and genera of ectoparasites dealt with in the book except for those that are only enumerated in checklists. Details of collecting data and disposition of type materials, acknowledgments, and the like are especially well handled. The quality of

the numerous illustrations ranges from good to excellent. Other figures, diagrams, charts, and distribution maps are commensurate with the handsome format. The 35-page index is an example of how an index should be but seldom is prepared. Indeed, the entire book is an important scientific contribution, a guideline for workers elsewhere, and a service to biomedical and allied disciplines.

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Drosophila Handbook

Genetic Variations of Drosophila melanogaster. DAN L. LINDSLEY and E. H. GRELL. Carnegie Institution of Washington, Washington, D.C., 1968. 11 + 472 pp., illus. $3. Carnegie Institution of Washington Publication No. 627. A revision of *The Mutants of* Drosophila melanogaster.

Here, at last, is the long-awaited compendium and a guide to the study of the genic and chromosomal variations in *Drosophila melanogaster* described in world literature. The book modestly calls itself a revision of C. B. Bridges and K. S. Brehme's *The Mutants of* Drosophila melanogaster, published almost a quarter of a century ago. In fact, it is a new and monumental work, embodying what must have been a prodigious amount of meticulous and conscientious work on the part of the authors. Not the least remarkable among the qualities of the book is the low price, which makes it accessible to all who may be interested.

The book is divided into seven parts of very unequal size. The first is a review of mutants, comprising some 3000 entries and 282 pages. For each mutant are given its name, its symbol, and, wherever possible, its location in the chromosome, its origin (spontaneous or induced), the name of the discoverer, literature reference or references, a concise description of the phenotype, and other information, such as the cytologically visible changes with which it is associated. The second part, Chromosomal Aberrations, contains some 1500 entries in 120 pages. Deficiencies, duplications, translocations, inversions, and transpositions are listed with data and references similar to those for the mutants. The third part, Special Chromosomes, 16 pages, lists "balancers," compound chromosomes, multiply marked chromosomes, X-Y chromosome combinations, and variants of Y chromosomes. Here, then, one has an abundance of materials usable for a variety of genetical tricks and contrivances, possible thus far only in *Drosophila* and permitting a latitude of experimental design possible with no other experimental organism. The following short chapters deal with cytological markers, polyploids and aneuploids, and nonchromosomal inheritance and include a list of only ten more or less widely used wild-type strains (for *Drosophila* species other than *melanogaster* such lists would have to be considerably longer). In lieu of conclusions and a summary, there are 50 pages of cytogenetic maps of the chromosomes. The loci of the mutants on genetic maps are here given in the linear order as derived from linkage and recombination studies; for a minority of the genes located also on the cytological maps of the giant chromosomes of the salivary gland cells, the particular discs, or groups of discs, which correspond to these genes are indicated. The seven folded plates reproduce the disc patterns in the salivary gland chromosomes, as drawn by C. B. Bridges and P. N. Bridges. In sum, the authors' many colleagues will profit greatly by using this book in their work.

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Natural Therapy

The Great American Water-Cure Craze. A History of Hydropathy in the United States. HARRY B. WEISS and HOWARD R. KEMBLE. Past Times Press, Trenton, N.J., 1967. viii + 236 pp., illus. $7.50.

In a day in which chiropractic and naturopathy attract wide popular support and mount strong political pressure, the serious study of past -isms and -pathies not only enriches the history of science but also casts light on social processes still very much at work. Books such as Davies' *Phrenology: Fad and Science,* Kett's *The Formation of the American Medical Profession* (as to homeopathy and Thomsonianism), and Darnton's *Mesmerism and the End of the Enlightenment in France* treat sects not as amusing aberrations of a prescientific age but as embodiments and reflectors of complex social, scientific, and philosophical currents.

The Great American Water-Cure Craze is not so rewarding because, although there are occasional hints, its authors do not place hydropathy within a broad frame of reference and relevance. They have, however, with unflagging antiquarian zeal, gleaned from a few manuscript collections and numerous printed primary sources, especially the prolific water-cure journals, data about scores of hydropathists and the institutions at which they practiced.

This flood of evidence demonstrates that hydropathy was indeed an American craze from the 1840's, when disciples imported from Austrian Silesia the cold-water gospel of Vincent Priessnitz, until the early 1900's, when the followers of a later leader, the Swabian priest Sebastian Kneipp, found their businesses languishing. The vogue owed something to the ancient mystical faith in water's healing power. It owed more to the fact that water was thought a "natural" mode of treating disease in an age when many people came to deem drugs and bleeding unnatural, especially as heroically practiced by orthodox physicians. Hydropathy itself had its heroic practitioners, prescribing regimens of up to 16 baths a day, including icy plunges and the powerful pounding of the douche, a narrowly focused stream falling from great heights. As time went on, however, hydropathic rigor was generally watered down and, at rural water-cure establishments (as at more aristocratic spas), became one element in a pattern of healthful, natural living to which the harried urbanite escaped. One Pennsylvania promoter, for example, offered the public "Nature's agencies, sunlight, pure air, exercise, sleep, food, right social relations, hope and trust and last but not least, water."

In a period of ultraism, hydropathy also merged with other doctrines challenging the establishment. Many of its articulate proponents combined hydropathic sentiments with homeopathy, vegetarianism, phrenology, abolitionism, woman's rights. Mary Gove Nichols provides an instructive example of such a fusion of beliefs. It is indicative of the authors' restricted researches in the broader range of materials that might have provided them a sounder interpretative setting that they did not use Blake's excellent article on Mrs. Nichols in the 1962 *Proceedings of the American Philosophical Society.*

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