Apart from various short remarks, there are 15 papers, ranging from a clear account of the current theory of the spectral-type by Pecker in which the many difficulties are emphasized, to an important discussion by Strömgren of his work on a two-dimensional classification of F-type stars using photoelectric photometry with interference filters.

Among the other contributions, Morgan has a short discussion of the problem of the spectral classification of the two stellar populations. Deutsch, in a paper illustrated with Palomar coudé spectrograms, reports on observations related to stars that are members of open or globular clusters; he discusses among other things the distribution of rotational velocities in stars of early type. Barbier has an interesting account of the use of the position and magnitude of the Balmer discontinuity in spectral classification, while Chalonge proposes to make the Morgan-Keenan system more precise by the introduction of a third parameter, the absolute gradient in a prescribed spectral region.

Certain problems became apparent during the discussion. For example in Chalonge's three parametric classification system, it happens that high-velocity stars differ systematically from low-velocity stars. This is a special case of the general problem of finding more fundamental relationships between spectral-type properties of stars and their other characteristics, such as rotation, space motion, and light variability. Such relationships when found might serve to unify somewhat the various families in which stars are now divided. This book can be recommended to students of stellar spectroscopy and statistics as giving an account of the many problems current in this field.

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The Flood Control Controversy. Big dams, little dams, and land management. Luna B. Leopold and Thomas Maddock, Jr. Ronald Press, New York, 1954. xiii + 278 pp. $5.

Free enterprise implies the assumption of risk. But we have long since abandoned the idea of unlimited risk, preferring some degree of control in the interest of general welfare. A nice problem arises, however, in deciding upon the extent to which general versus special interest is to be served when fiscal and legislative measures for minimizing risk are proposed. Certainly there has been an increasing drive on the part of special groups in industry, business, and agriculture to eliminate, at public expense, any risk so far as they are concerned.

Flood control, so-called, is an excellent case in point, now absorbing expenditures in the billions of dollars. Quite apart from immediate administrative and technical considerations, this activity involves principles that impinge upon the character and destiny of our national life. The Conservation Foundation, dedicated to the conservation of renewable natural resources, has performed a notable public service in making possible the writing of *The Flood Control Controversy,* in every way an unusual book. Leopold and Maddock, on leave, respectively, from the U. S. Geological Survey and Bureau of Reclamation, have had access to many unpublished records and to comment from government officials. Their fitness is further evident from the clarity and power of their writing and the competence with which they have analyzed and presented matters of great technical complexity. Flood control, they point out, is itself a misnomer. What is really involved is the reduction of flood hazard and damage. The basis of the problem lies in the competition between cultural and geologic processes. Channel and floodplain are alluvial phenomena, "creatures" of the river. At the same time valley lands are often highly productive for agriculture and convenient for urban development. In principle their use by man involves hazard and should be regarded as a calculated risk, like the establishment of vineyards on the slopes of a volcano. A sardonic footnote on the intensity of urban use comes from the fact that prudent investors may avoid flood risk, making lowlands inexpensive and attractive to others. Again, the erection of flood "control" works may result in false optimism and increased intensity of use. Thus the process of protection naturally leads to the necessity for still further protection.

Under a concept that has been growing since the 1930's remedial measures are no longer a charge against the direct beneficiaries but against the commonwealth. Further, the alienation of space for engineering works disrupts the economy upstream from those benefited—a situation that would not have been tolerated prior to 1900 when economy and politics were still largely rural.

Even today it meets with protest, manifest as the little dam–big dam controversy, essentially the subject of this book. As one who welcomed a reexamination of the almost exclusively engineering philosophy as applied to watersheds and attacked in Elmer Peterson's *Big Dam Foolishness* [*Sci. Monthly* **81**, 43 (1955)], I regret that *The Flood Control Controversy* was not available when Peterson wrote his lively polemic.

Responsibility for minimizing flood damage is divided between two agencies —Army Engineers and the Department of Agriculture. The Army Engineers work upward from the lower channels where flood damage has high visibility and where they have been traditionally engaged in improvement of navigation. In a sense they typify urban pressures. Agriculture is assigned to work downward from the headwaters and obviously spearheads the rural viewpoint. Having realized that improved land use and land management can alleviate, but not control, the flood problem, the Department of Agriculture has ventured into the engineering field with headwater dams. Thus we have, over and above any conflict of philosophy, a tangible one of jurisdiction.

As the authors take care to point out, neither approach is a substitute for the other. To the degree that flood "control" measures can be justified (and this is by no means yet clear, either from the facts or from the present allocation of costs) the downstream and upstream approaches are complementary. There is no question that, under any type of valley management, exceptional patterns of rainfall may get a drainage system out of hand. Nor should there be any question regarding the need for a watershed under sound land use and management before costly and permanent engineering works are set up downstream. I hold painful recollections of the Grand River fiasco, in which my advice to safeguard any dam by an initial program of soil conservation was summarily rejected.

As the authors say, flood "control" is now big business. It is up to those who foot the bill to control the "control," and a practical first step for the citizen is to read this excellent book. A further step, devoutly to be wished, is for more men in responsible places to develop the same broad combination of engineering discipline and biological insight as Leopold and Maddock.

Perhaps it is not too much to hope that they can be induced to apply their gifts to a similar analysis of the irrigation and reclamation problem, which up to the present has seemed highly elusive.

Three very minor points may be mentioned in concluding this review. The technical distinction—and it is important—between land use and land management is somewhat blurred. The alleged effect of levees in raising the stream-bed level is not discussed. And finally in accepting present patterns of land use as more or less economically necessary, no account is taken of the recent remarkable progress of the art of grass farming or of the artificial effects of crop subsidies. But these matters are more than offset by the authors' clear and repeated insistence on the need for more fundamental and more long-continued research. One of the tragic costs

of democracy is the waste of money and talent when projects that should continue through decades are allowed to wither for lack of sustaining appropriations. The hit-and-run techniques that at times serve developmental research in the physical sciences will not do when we are dealing with secular processes. These processes furnish background, perspective, and context for the effective application of all science.

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The Language of Social Research. A reader in the methodology of social research. Paul F. Lazarsfeld and Morris Rosenberg, Eds. Free Press, Glencoe, Ill., 1955. xiii + 590 pp. Illus. $6.75.

This reader is one of a growing list of books on social science methodology that have been published in the last several years. It represents the continuation of what seems to be an increasingly concerted effort to make explicit the design of social research and to codify social science procedures and techniques.

The volume is, on the whole, an excellent collection of papers. By being brought together, these papers are not only made more readily accessible, but they also take on a cumulative value as contributions to the development of more objective and rigorous social science research.

The work, however, contains many gaps and deficiencies, partly because it does not set out to cover all of social science method and partly because it reflects the present relatively primitive state of social science. The "Reader" does not attempt to cover such topics as sampling, questionnaire construction, and experimental design for which "there is already a standardized literature. It does not deal with mathematical techniques that require knowledge "beyond that which the average social scientist is likely to have." It excludes also consideration of topics whose "methodological implications have not yet been codified adequately at all." It purports to emphasize the "analysis of material which has been properly collected." The editors appropriately admit that the selections are not necessarily representative of the literature but were gathered in considerable measure from the work of "colleagues and junior associates of the senior editor" in his work at Columbia University. However, it may be noted that this does not detract from the apposite character or usefulness of the selections.

The materials written by the editors, while all too brief, together with the outline of the book, do give the work some measure of cohesion and provide, on the whole, an adequate rationale for the selection of the readings. In a brief general introduction and short introductory statements to each of the six sections into which the volume is divided, a general conception of science is presented and the following major topics are treated: "Concepts and indices," "Multivariate analysis," "The analysis of change through time," "Formal aspects of research on human groups," "The empirical analysis of action," and "Toward a philosophy of the social sciences." Especially useful is the contribution of the editors to the clarification of the steps involved in the delineation of problems for research and in the analysis and interpretation of research results.

The volume is not a self-sufficient treatise on social science methodology. Its title is, therefore, rather too comprehensive in that it covers only a small part of the "language of social research." As a supplement to more comprehensive works on the philosophy of science and on social science method, it is, nevertheless, a useful contribution to the literature.

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The Pharmacological Basis of Therapeutics. Louis S. Goodman and Alfred Gilman. Macmillan, New York, ed. 2, 1955. xiii + 1831 pp. Illus. $17.50.

There is a certain fascination in comparing the first and second editions of this book—the 14 years elapsed are paralleled by remarkable advances in many directions. The antibiotics, the newer adrenal steroids, adrenergic blocking agents, radioisotopes, and antihistaminics are all substances that were largely unknown at the time of the first edition.

The growth in the amount of subject matter has resulted in an increase in both the bulk and price of the book by about 50 per cent; it cannot be said that pharmacology has become much more comprehensible in terms of mechanisms during the last 10 years or so, but the fact that the authors have been able to encompass the multitude of new developments in their text bespeaks much in the way of organizational effort. This is a medical textbook, and as such its treatment ought to be directed toward practical ends; nevertheless there is much use made of Goodman and Gilman by research workers who are not primarily concerned with medicine, and it is therefore gratifying to find that the treatment of structure-activity relationships of various classes of drugs has been greatly expanded in this new edition. As was true in the first edition, the treatment of autonomic drugs is particularly outstanding, and I am also impressed with the concise presentation of the vast literature connected with the adrenal steroids. The fact that a substance that was discovered as recently as aldosterone is covered in some detail is an indication of the continuous revision of the text that must have taken place up to the time of publication. There are a few errors: the partition coefficient is incorrectly defined, the structure of podophyllotoxin appears to be out of date, and it is somewhat surprising not to find serotonin listed. These minor errors in no way detract from the general impression that this is both a reference work and a textbook of the most reliable sort.

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Advanced Calculus. An introduction to classical analysis. Louis Brand. Wiley, New York; Chapman and Hall, London, 1955. xii + 574 pp. Illus. $8.50.

The nature of this book is indicated by its subtitle, "An introduction to classical analysis." It differs from books on elementary calculus in two major respects: (i) in the emphasis given to definitions, theorems, and rigorous proofs; and (ii) in the inclusion of chapters on "Vectors" (Chapter 5), "Line integrals" (Chapter 8), "Uniform convergence" (Chapter 10), "Functions of a complex variable" (Chapter 11), and "Fourier series" (Chapter 12). Some other more advanced topics are treated briefly in sections of various chapters—for example, implicit function theorems and Lagrange multipliers with "Functions of several variables" (Chapter 4) and Green's and Stokes' theorems, with "Multiple integrals" (Chapter 9). As the author states, the book deals essentially with functions of a real variable. His purpose in including Chapter 11 is to complete the explanation of certain portions of real variable theory—for example, intervals of convergence for series—and to show the use of complex integration in computing certain real integrals.

The development of the real and complex number systems is sketched in Chapter 1. In Chapter 2 ("Sequences and series") some of the basic concepts of analysis are introduced in their simplest setting. Chapter 3 ("Functions of a real variable"), Chapter 6 ("The definite integral"), and Chapter 7 ("Improper integrals") are largely a review of elementary calculus, but with the different emphasis that I have mentioned. Only the Riemann integral is considered.

The book generally is on the usual level of courses in advanced calculus for undergraduates and beginning graduate students. It is better suited for those majoring in mathematics than it is for phy-