53[Q, V, X].—A. H. TAUB, General Editor, *John von Neumann, Collected Works, Volume* VI, Macmillan Co., New York, 1963, viii + 538 pp., 25 cm. Price $14.00.

This is the sixth and last volume of the collected works of John von Neumann, published under the general editorship of A. H. Taub, a close associate of von Neumann. This volume alone is sufficient to remind those of us, who had the good fortune to know von Neumann personally, of the breadth of his scientific interests and achievements and of the fundamental contributions which he had made in so many diverse fields. The sixth volume contains papers in the theory of games, astrophysics, hydrodynamics, and meteorology. In each of these fields he not only made significant contributions but initiated, by his work, new areas of research which will be pursued by scientists for decades to come. Thus, he may be considered as the father of the modern theory of games as well as of the numerical prediction of weather by the solution of the governing hydrodynamic equations.

The writer is most familiar with his work on the interaction of shock waves, which is covered in this volume. This is another field in which his contributions have become the basis for a major area of scientific endeavor both by his contemporaries and by future investigators. The readers of this journal may be interested to know that von Neumann was not only a prime mover in the development of modern digital computer systems, but that he was perhaps the most outstanding human computer of his generation. The paper entitled "The Mach effect and height of burst," by F. Reines and John von Neumann (pages 309–347) reminds the reviewer of an incident which occured during World War II, just prior to the detonation of the first atomic device over Japan. Von Neumann had arrived in Washington to attend a special meeting at which the possible use of this new weapon was discussed. On the train from Princeton, he hurriedly carried out a very lengthy and complex computation in order to determine the height at which the burst should take place in order to attain maximum blast damage. He did this with a pencil on a piece of scratch paper, without the aid of any mathematical tables, formulas, or any modern computer devices. Upon his arrival he handed the paper to me and asked me to please obtain an accurate solution and to call him at the conference as soon as possible. Using all the mathematical tables at my disposal and an electrically operated Friden calculator, I proceeded to recalculate the optimum height of burst as rapidly and accurately as I could. I obtained my result only after four hours of painstaking work and found to my surprise and some chagrin that his result and mine agreed to four decimal places.

H. P.

54[S].—DIETRICH HAHN, ET AL., *Seven-Place Tables of the Planck Function for the Visible Spectrum*, Academic Press, New York, 1964, xxi + 135 pp., 21 cm. Price $5.50.

Let

$$S = \lambda^{-5}[-1 + \exp(c_2/\lambda T)]^{-1}; \qquad H = SV(\lambda);$$

$$\Sigma S = \frac{1}{\Delta\lambda}\int_{350}^{845\text{nm}} S\,d\lambda; \qquad \Sigma H = \frac{1}{\Delta\lambda}\int_{385}^{780\text{nm}} SV(\lambda)\,d\lambda.$$

In the above, $V(\lambda)$ is the relative spectral luminosity—an empirical function which is given in Table 1, page 3, to 3S for $\lambda = 385(5)780$ nm [1,000 nm $= 1$ μm]. Two values of c_2 are used; namely 14380 and 14420 m°K. Values of S and H corresponding to the first and second value of c_2 are termed S_1, H_1 and S_2, H_2, respectively. The main table, consisting of 120 pages, gives S_1, S_2, H_1, H_2 to 7S for $\lambda = 350(5)$ 845 nm, for each of 60 values of T, ranging between 973.15°K and 15,000°K. The decimal point has been omitted; it belongs "in the first gap" of the tabular entry, as stated in the Introduction. Since H depends on $V(\lambda)$, it is not known to more than three significant figures. The inclusion of seven digits (and the omission of the decimal point) must be ascribed to the needs of mass-production handling. Two-page tables of ΣS_i and ΣH_i, where $i = 1, 2$, are given, for the values of T of the main table; another two pages contain their common logarithms. Table 5 (the last) is a one-page tabulation of $B = 60 \int_0^\infty H(\lambda, T)\, d\lambda / \int_0^\infty H(\lambda, T_{pt})\, d\lambda$ for $c_2 = 14380$ and $T_{pt} = 2042.15$ (units the same as before), for 24 values of T.

The introductory material is given in both German and English. The table proper is a clear, legible reproduction of IBM tabulations. The calculations of S appear to be correct. However, the values of ΣS_i are reliable to only three significant figures, according to tests made by the reviewer.

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55[W, X, Z].—SAUL I. GASS, *Linear Programming, Methods and Applications*, McGraw-Hill Book Company, New York, 1964, xii + 280 pp., 24 cm. Price $8.95.

This is the second edition of this work, which originally appeared in 1958 and was reviewed in *MTAC*, v. 13, 1959, pp. 60–61. The book is intended as a text for a rather complete first course in linear programming at an upper-undergraduate or graduate level. Care has been given to make it especially understandable and useful for the non-mathematics major.

Other than the correction of typographical errors, the reviewer could find no significant alteration of the original text, but several additions enhance its usefulness. The number of exercises at the end of each chapter has been increased. A number of the added exercises are of a rather simple computational nature to help the less mature reader. Several explanatory footnotes and short paragraphs have been scattered throughout the volume. The results of an iteration missing in the first edition have been added to the example on page 109.

The more significant changes from the original text are as follows: the Survey of Linear-Programming Applications has been moved from Chapter II to the Introduction, where it belongs. A paragraph has been added on page 70 to note how the determinants of the bases used in the simplex procedure can be readily obtained as a by-product of the computation. A short statement about slack variables has been expanded to a full section on pages 76 and 77.

A valuable nine-page section on sensitivity analysis has been added to the end of the chapter on parametric linear programming. Full sections on integer linear programming and the decomposition algorithm of Dantzig and Wolfe to reduce