and to present these results in a systematic and orderly manner, so that the basic material would then be readily available to the scientific public. The book makes no attempt to investigate all questions of the theory of elasticity for anisotropic bodies, but restricts its attention to certain parts of the theory which have been rather thoroughly studied but not previously organized. For instance, the author does not treat the questions of stability and deflections of elastic plates, since these problems were covered in his earlier book. He also omits all problems of equilibrium and stability of anistropic shells as well as questions connected with plasticity or large deformations of anisotropic bodies.

Chapter I deals with the general equations of elasticity of an anisotropic body. It contains numerous examples and the details of the derivation for various types of anisotropy. Chapter II investigates the simplest cases of elastic equilibrium—stretching and bending of rods and plates under various conditions and with various types of anisotropy. Chapters III and IV treat problems connected with an anisotropic body bounded by a cylindrical surface for which the stress does not vary along the generator. Here the author first derives the general governing equations and then treats in detail generalized plane stress problems, torsion problems, bending problems, etc., giving particular consideration to the case of cylindrical anisotropy. In these sections he extends Muskhelishvili's work in the plane theory of isotropic elasticity to the anisotropic case. Chapter V deals with the state of stress of an anisotropic cantilever of constant cross section deformed by a transverse force. The final chapter covers symmetric deformation and torsion of bodies of revolution. Here a number of examples are treated in detail.

The author has consistently kept his exposition brief but lucid. As a result the book is well within reach of the senior graduate student. The English translation will certainly be welcomed by research scientists in the physical and engineering sciences and by design engineers.

L. E. Payne

University of Maryland
College Park, Maryland

52[Q, S].—Ralph Deutsch, *Orbital Dynamics of Space Vehicles*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1963, xv + 410 p., 24 cm. Price $16.00.

The advent of the Sputniks has brought a rash of what purport to be Space Age textbooks; and this is another. Some appear to be motivated by an uncontrollable desire to rush into print; and, on the other extreme, some appear to make a serious effort to make the material comprehensible to beginners and the uninitiated. The present volume under review has a peculiar place in this spectrum: it is not elementary, and it attempts to cover all aspects implied by its adopted title. Within the bounds of 410 pages, this is patently impossible, and therein lies the principal criticism. Many books come into being naturally from the notes of a course which the author has taught several times. They become "tried and true". It may well be that the present material came from a course which was taught once. But there is a wide disparity between treatments, e.g., Cowell's method is presented on one page of prose, whereas Musen's modification of Hansen's lunar theory as applied to artificial satellites is copied in great detail from the published papers. One also detects the influence of the Yale Summer Institutes in Dynamical Astronomy, which the author undoubtedly attended.

The chapters cover two-body motion, orbit determination, analytical dynamics, general perturbations, special considerations for artificial satellites, nongravitational forces, special perturbations (for which the author seems to have a "blind spot", since most of this chapter consists of Musen's numerical general theory), reduction of radio observations, orbit improvement, transfer orbits, and a final chapter on the problem of three bodies. The organization of the references leaves much to be desired. One must only deplore the dissipation of the author's obvious competence on such a "broad-brush", transparent treatment as this is.

PAUL HERGET

University of Cincinnati
Cincinnati 21, Ohio

53[S].—COMMITTEE ON FUNDAMENTAL CONSTANTS OF THE NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL, A. G. MCNISH (Chairman), "New values for the physical constants," *National Bureau of Standards Technical News Bulletin*, October, 1963.

A new consistent set of values for the fundamental physical constants has been recommended by the above committee. It is anticipated that these will be adopted by the International Unions of Pure and Applied Chemistry and Physics. A full report of the background entering into this set of values was discussed by J. W. M. DuMond and E. R. Cohen at the Second International Conference on Nuclidic Masses, Vienna, July 1963.

The *meter* is defined as 1650763.73 wavelengths *in vacuo* of the unperturbed transition $2p_{10} - 5d_5$ in ^{86}Kr. The *second* is 1/31556925.9747 of the tropical year at 12^h ET, 0 January 1900. (The latter definition does not appear to be very neat operationally, since it is not clear how a direct comparison could be made. As a colleague remarks: "Times have changed since then.")

Of the famous atomic constants we mention here only the proposed values:

$$\begin{aligned} c &= 2.997925 \pm 0.000003 \cdot 10^{10} \text{ cm/sec}, \\ e &= 4.80298 \pm 0.00020 \cdot 10^{-10} \text{ esu}, \\ h &= 6.6256 \pm 0.0005 \cdot 10^{-27} \text{ erg sec}. \end{aligned}$$

All errors listed are 3 standard deviations, and it is stated: "It is therefore unlikely that the true value of any of the constants differs from the value given in the table by as much as the stated uncertainty." Consistent with the above values is

$$\frac{hc}{2\pi e^2} = 137.0388 \pm 0.0019,$$

which, at least on the face of it, contradicts Eddington's notion that this ratio equals 137 exactly.

A plastic wallet-sized card listing some of these constants is available from the National Bureau of Standards for 5 cents.

D. S.