

points out, FET's are a perfect device for introducing small-signal analysis. Other aspects of linear circuitry are thoroughly covered, as are oscillators and delay lines. If any criticism can be made of this book, it would be the lack of extensive material on operational amplifiers and digital circuitry. There is however, an excellent chapter on noise. While most of the examples are from nuclear electronics (an entire chapter discusses applications in this area) the material is not so specialized that it detracts from the utility of the book for scientists working in other specialties. The author does assume a knowledge of dc and ac circuits but uses standard notation.

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The Velocity of Light And Radio Waves

By K. D. Froome, L. Essen
157 pp. Academic, New York, 1969.
\$5.00

At the National Physical Laboratory in the UK, time-standard authorities Keith D. Froome and Louis Essen have pioneered modern measurements of the vacuum speed of electromagnetic waves, a constant of unique theoretical and practical importance. Including their own work, they have presented a well balanced survey of the field in an excellent monograph, much of which can be understood by the scientific generalist.

The book contains a pre-1900 survey, discussions of the nature of light, standards, measurement accuracy, de-

scriptions of the time-of-flight methods of Albert A. Michelson and the electro-optical shutter improvement, electrical methods involving the ratio of charge units, transmission lines and cavity resonators. Three chapters describe radiowave interferometers and modulated light beam and radiowave devices. The latter two, the geodimeter and tellurometer, are operational field instruments for accurate surveying by trilateration and claim accuracy of 1 part in 10^7 .

The authors quote $c_0 = 299\,792.5 \pm 0.4$ km/sec as the value recommended by authorized international commissions in 1958 and still generally accepted at the time of writing, and they emphasize that the main problem is to eliminate systematic rather than random errors. The book closes with a delineation of several proposed methods such as gamma rays in the Mössbauer effect, a laser beat method and a light-pulse recycling oscillator.

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Isospin in Nuclear Physics

D. H. Wilkinson, ed.
751 pp. American Elsevier (North Holland), New York, 1970. \$43.50

It has been nearly four decades since Werner Heisenberg introduced the concept of isotopic spin to distinguish between the neutron and the proton. During that time, this convenient dichotomic variable has assumed an ever growing importance in our description of nuclear phenomena. This growth, of course, reflects the close connection between the isotopic spin (isospin) and

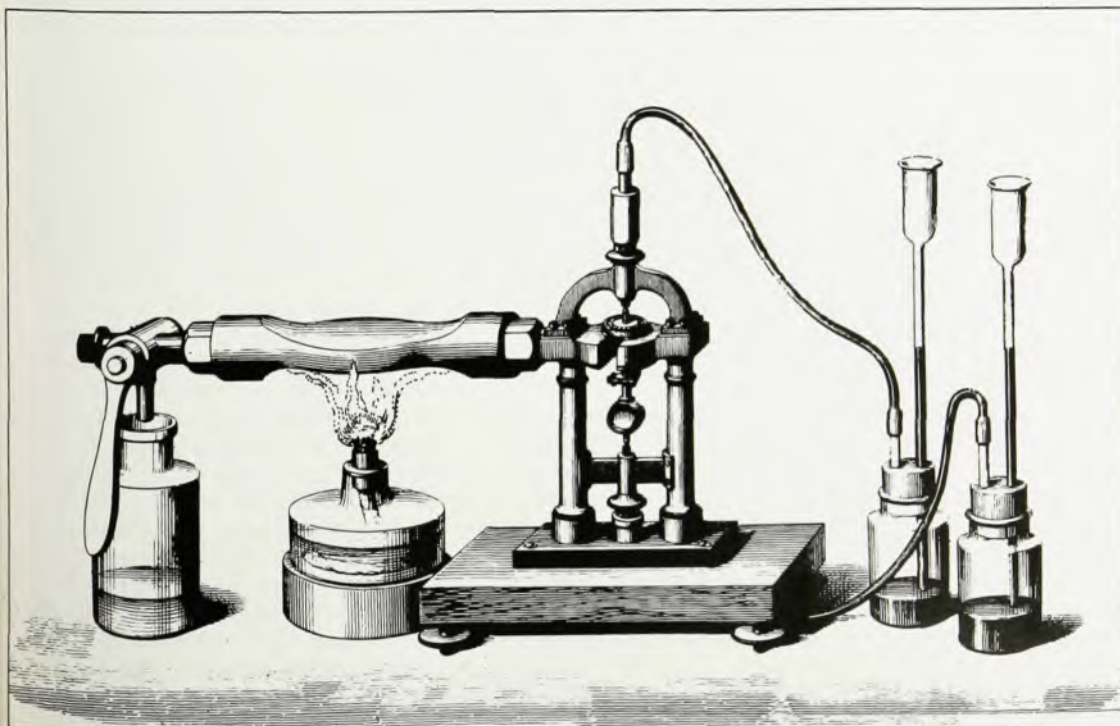
the charge independence of the nuclear force.

Denys H. Wilkinson, the editor, is a professor at the University of Oxford. In his words this book represents "a current review of growth points in all parts of the nuclear structure field . . . where charge independence is a dominant factor." As such it is eminently successful.

After an historical introduction by Wilkinson, there are 13 chapters on all aspects of isospin, each by a different author. The first of these, by Ernest Henley, develops evidence for charge independence and charge symmetry in nuclear forces. His conclusion on the basis of experimental findings (to 1968) and on theoretical corrections strongly supports the validity of these symmetries. More quantitatively, he finds that charge symmetry for hadronic forces holds to within 0.8% and that charge independence is broken by about 2%, thus fixing this cornerstone of the isospin concept.

The role of such symmetries in nuclear physics and their description by group-theoretic techniques is the subject of chapter 3 by J. P. Elliott. He considers first exact or near-exact symmetries, such as charge independence, and then goes on to the more approximate ones associated with the unitary groups. The exposition is succinct, and in less than 40 pages it carries the reader from basic concepts to a discussion of Elliott's own contributions to the understanding of spectra in the sd shell using SU(3).

Having established in the first three chapters the background, the validity and the mathematical formulation of charge independence and isospin, Wilkinson devotes the remaining parts of



Air turbine that rotated a small mirror at constant velocity in J. B. L. Foucault's laboratory determination of the velocity of light, in 1850.