cal treatment by Strajman (*6*) it is possible to calculate the characteristics of the tube geometry with respect to the *in vivo* counting behavior. It may be shown that, as the thickness of a homogeneous source of radioactivity is increased, the counting rate approaches a limiting value. The relationship may be resolved into such factors as the geometry of the counting assembly and the energy and self-absorption, including scattering, of the source. An empirical curve comprising these factors may be constructed which expresses the counting rate at any source thickness as a percentage of the limiting maximal counting rate at infinite thickness. Such a curve was derived for a gamma emitter of 0.5 Mev homogeneously distributed in a medium of specific gravity 1.05, and several values from the curve have been placed at corresponding distances from the tube in Fig. 2. Because of lack of complete data at present, the effect of scattering has been approximated in this case.

The curve has been verified experimentally at several points by counting the activity of various thicknesses of a solution of $K_2C^{11}O_3$. C^{11} is a positron emitter (*4*) which therefore exhibits an annihilation gamma energy of 0.51 Mev. It is this energy which may be utilized for *in vivo* measurement of C^{11}.

As many as four of the counting assemblies have been used simultaneously to record distribution of a radioisotope in various parts of the body. This has been done conveniently by placing four mechanical registers in juxtaposition with an electrical timer reading to 0.01 min on a panel and photographing them with an ordinary 35-mm camera at the desired time intervals. Good results have been obtained with CO tagged with C^{11} and with gold colloid tagged with Au^{198}, and it is to be presumed that the performance would be satisfactory with any gamma emitter of relatively low energy. The thickness of the lead shield and the dimensions of the collimator may, of course, be varied to meet individual requirements. It has been found convenient, for measurement of experiment background, to insert a lead plug into the collimator with the counter in position on the body surface, thus taking into account radiation which may penetrate the shield. This has been found to be insignificant with gamma energies of 0.5 Mev, but becomes appreciable with energies greater than 1 Mev.

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Book Reviews

College physics: mechanics, heat and sound. (Pt. 1.) Francis Weston Sears and Mark W. Zemansky. Cambridge, Mass.: Addison-Wesley, 1947. Pp. 383. (Illustrated.) $3.50.

This text is essentially an abridged version of Sears' *Principles of physics I*. It is the first volume of two, and the purposes of the abridgement are to reduce a two-year course to one year and to eliminate the use of the calculus in the course. Therefore, a number of chapters have been removed, and a number of topics included in the parent volume have either been neglected or treated more briefly; in addition, all elements of the text requiring a knowledge of the calculus have been removed or rewritten using limit or averaging concepts.

The replacement of the calculus by other methods has been done very skillfully and the revision therefore suffers very little in comparison with its model. The presentation of the principles of physics is indeed, for some topics, somewhat improved by the substitution used.

The general scope of the text has not been further restricted, but for the purposes of a review it is important to list the specific, major topics that were either bodily removed or severely curtailed. These are: the concept of the resultant of a set of concurrent forces; non-uniform acceleration; center of mass and the theorems and problems on the motion of the center of mass; the chapter on work (rewritten; however, it now includes a section on simple machines); the principle of virtual work; the chapter on gravitation (reduced to several paragraphs in the chapter on weight and mass); discussion of the Poisson ratio and the Saint-Venant formula for circular cylinders; Lissajous figures, damped harmonic motion, and resonance phenomena; two-dimensional impacts; the chapter on hydrostatics (somewhat rearranged to give a smoother presentation); surface tension and the Poiseuille formula; discussion of entropy; the chapter on kinetic theory.

Special mention is now made that the reduction of the section on heat has resulted in an improvement of the treatment of the first law. There is now a chapter on the first law and this includes several applications and illustrations previously separated into different chapters. The result is more satisfactory.

The textbook may be classified as excellent and as complete as can be expected for application to a one-year course in college physics.

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