

Each of these chapters is well planned, lucidly written, and includes well-chosen problems illustrating the points made.

These alone would make this book a worthwhile addition to the literature, but its true value lies beyond this in the depth of the discussion of what, for lack of a better term, must be called the philosophy of experimentation. This subject which goes to the roots of physics involving, as it does, the reciprocal relations between theory, measurement, and experiment is a field too often passed off by a brief preface in a laboratory manual. Yet, it is this philosophy that gives point to our laboratory efforts and raises them above the level of tinkering.

Again, the book has value beyond its use as an adjunct to a laboratory course for it makes an excellent book to hand to each newcomer to a research laboratory and also for the older people who need reference to least squares, normal distribution and the like. The utility of the book is enhanced by its sturdy looking semi-limp binding.

I believe congratulations are due to all involved in the book's preparation.

Progress in Biophysics and Biophysical Chemistry, Volume 2. J. A. V. Butler, B. Katz, R. E. Zirkle, eds. 277 pp. Pergamon Press, New York, 1961. \$12.50. Reviewed by Joseph G. Hoffman, University of Buffalo.

THE six review articles presented are timely and highly commendable, but the atomic age with its emphasis on radioactivity is seen again: three of the papers involve ionizing radiations and living systems. The first of these, "Natural Radioactivity of the Human Body", by W. V. Mayneord, might well have been entitled The Alpha Activity of the Human Body and of Human Foods. In these days of endless inquiry about radiations and human-tissue tolerances, Mayneord's paper gives a timely report on a fundamental aspect of radioactivity in living systems. Alpha activities are exceedingly small, yet most of us are curious to see what they are in mundane things such as sardines, walnuts, tapioca, chocolate, peanuts, and so on. Of the nearly two hundred foods listed it is noteworthy that the extreme case is in Brazil nuts. In arbitrary units, Brazil nuts count at 1750, while the next highest food in magnitude is a cereal (United Kingdom) at 58. Peanut butter is 12, bread is 3, and ice cream is 0.7. The lowest of alpha activities is less than 0.1 for baked beans. As for human tissue, Mayneord's figures for an Egyptian who died about 4000 years ago are about equal to those for bones from humans in this century. Animals such as cattle and other domesticated animals have wide ranges of alpha activity at much higher levels than humans. A typical human sustains in a 70-year lifetime about 3.3×10^{10} alpha disintegrations in his tissues. This is about one curie second and is extremely low from the dosage standpoint even though each disintegration in a live cell would be lethal for that cell.

Mayneord's 23-page report is concise and is recommendable to the general reader as well as the technical specialist.

The other two radiation papers are by R. Goutier on the mode of action of x rays on the biosynthesis of nucleic acids, and by L. G. Lajtha on the effect of ionizing radiations and chemotherapeutic agents on bone marrow. One of the most intriguing and also the most difficult paper is by A. N. Uttley on the engineering approach to the problem of neuro-organization. Four different kinds of technical language are used: psychology, neuro-psychology, physics, and computer mathematics. The reader soon is aware that the mind that studies is quite different from the mind that is studied, and that, moreover, the language for describing the physical construction of mind needs to be developed. Uttley's paper gives an excellent indication of the unique nature of the problems arising when one tries to say what a perceptive response is.

The two remaining papers are on vastly different areas of biology. The fifth paper by P. I. Corner deals with some factors influencing the dispersion of indicator substances in the mammalian circulation. The sixth paper by E. J. Denton is a review of the problem of the buoyancy of fish and cephalopods. Control of buoyancy is one of those typical biologic phenomena, which seem to violate physical law. Like the sodium ion pump, it evokes teleologic ideas. This is an extended review of about 54 pages on the description of fish and a review of the research which had led to the findings of various types of gas-filled buoyancy chambers as well as examples of fish which do not have a gas-filled swim bladder.

There is a seventh chapter in this book on cytoplasmic particles and their role in protein synthesis. It reviews an informal discussion held in March 1960 at the University of Reading in a series of abstracts and it contains a bibliography on subjects related to cytoplasmic particles.

Instruments and Measurements. Conf. Proc. (Stockholm, Sept. 1960). Helge von Koch, Gregory Ljungberg, Vera Reio, eds. Vol. 1, Automatic Process Control, Physical Methods of Chemical Analysis, 506 pp., \$16.00; Vol. 2, Nuclear Instrumentation, Measurement of Electric and Magnetic Quantities, Reactor Control, 721 pp., \$22.00. Academic Press Inc., New York, 1961. Reviewed by Peter L. Balise, University of Washington.

AS is typical of proceedings, the 120 papers in these books vary widely in subject matter and quality, ranging from descriptions of commercial instruments and reviews of basic techniques to interesting theoretical suggestions. The classification into five divisions seems arbitrary, since there is considerable overlapping of subjects and no segregation of papers within each category. About a quarter of the work is in German, the rest in English.

The greatest emphasis in the automatic process-control section is on computer control, with several appli-