



Review: [untitled]

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properties of an assembly of colliding particles and give indications that individual particle energies do not approach "equilibrium values."

Volume IV: *Biology and Problems of Health*, x+413 pp. \$8.50. In scanning this volume one is impressed with the ever increasing use of analytical methods, stochastic models, and statistical procedures, (and, of course, the high speed digital computer) in so many areas of medical science. The dominance of cancer in research and in public thought is reflected in the presence of seven papers (out of twenty-seven) in this area by Blum, Bryan, Dunn, and (on the particular topic of stochastic models of carcinogenesis) by Arley, Armitage, Doll, Tucker, and Waugh. Other areas of application treated include aging (H. B. Jones, W. F. Taylor), muscular contractions (Greenhouse), thyroid systems (Berman), chemotherapy (Bellman, Jacquez and Kalaba, and Mantel), respiratory systems (Dantzig, DeHaven, and Sams), epidemiology and ecology (Bartlett), survival and risk (Berger and Gold, and Chiang), fish populations (Chapman), low level radiation effects (Gentry and Parkhurst), physiology (Martin), transport phenomena in biology (Stephenson), growth in cell colonies (Eden). Papers in statistical theory are contributed by Berkson and Hodges (minimax estimator for the logistic function) and by Geisser (repeated measurements designs). Dixon gives a survey of the statistical uses of large computers in medical research.

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Natural Deduction. By John M. Anderson and Henry W. Johnstone, Jr. Wadsworth, Belmont, Calif., 1962. xii+417 pp. \$7.95.

A textbook designed for a year's course in mathematical logic, the presentation uses Gentzen's methods of natural deduction almost exclusively. Part One, which aims to teach how to *use* the system to formalize arguments, is commendable; natural deduction is certainly the most easily grasped of the various techniques of deduction, and the presentation here seems quite teachable.

On the other hand, Part Two, which devotes itself to metatheoretical considerations (consistency, completeness, etc.) concerning the systems developed in the first part, cannot be recommended: the metatheoretical talk is, lamentably, altogether too imprecise. For instance, no clear separation between individuals and names of individuals is made (cf. p. 141), a fact which makes a careful definition of "valid" and other semantical concepts impossible. Again, it is never stated that "having the property 1" is relative to an initial assignment to propositional variables—indeed, according to the definition on p. 293, propositional variables cannot have this property at all. These imprecisions and others like them are not isolated, but permeate the statement and proof of nearly all the important metatheorems. In the opinion of the reviewer, this situation overbalances the many nice features of this text.

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