cidal process because of the biological role of these granules and of the many enzymes they loose on the engulfed bacterium.

The chapter by Hager, Thomas, and Morris on a chloroperoxidase, which differs from myeloperoxidase in that it is able to chlorinate as well as iodinate substrates in the presence of peroxide, provides an interesting comparison with the leukocytic situation. That of Morrison, Bayse, and Danner on the role of mammalian peroxidase in iodination reactions amplifies the realization that the polymorphonuclear leukocyte has several similarities to thyroid cells. This has been hinted in the past from more general metabolic observations, such as the response of the thyroid to thyroid-stimulating hormone compared to the response of polymorphonuclear leukocytes to external particles they internalize.

As so often happens in collections of papers delivered at symposiums, the parts of the resulting book do not coherently form a crystalline whole. The chapter of Lehninger and Carafoli on calcium transport certainly cannot be faulted on its content or its importance. However, its inclusion in this particular volume is not easy to justify; it really does not seem germane to phagocytosis. Finally, the preface to the volume contains some statements that are not completely in accord with the views of some of the authors of the various chapters and that seem to be somewhat uncertain in the context of current experimental information.

Despite these remarks, this book does come at a fortunate time and will certainly stimulate interest in intracellular sequels of ingestion by phagocytic leukocytes, even if the larger theme envisaged by its title necessarily must await a more extensive treatment.

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Population Theory

Mathematical Topics in Population Genetics. KEN-ICHI KOJIMA, Ed. Springer-Verlag, New York, 1970. x, 400 pp., illus. $18.70. Biomathematics, vol. 1.

Ken-ichi Kojima has assembled a sort of "Festschrift for Everybody" in the field of theoretical population genetics. It is a mixture of review papers and original research papers. Their authors are among the most active researchers in the field.

There has been a shortage of good reviews that make the theoretical literature more accessible to newcomers. The reviews in this volume will go far toward filling this need, although they do not pretend to cover the field completely.

Sewall Wright reviews his "shifting balance" theory of evolution. Although Wright has not been reticent in stating his views in the past, this paper is valuable as one of the most concise and readable statements of his views on evolution. It also contains judicious comparisons of his theory with the views of Fisher and Haldane.

J. R. G. Turner reviews the work that has followed Fisher's fundamental theorem. His review contains an extensive exposition of the mathematics of changes in mean fitness.

R. H. Richardson reviews models of dispersion of organisms, the emphasis of the review being on comparisons of the models with real biological data. It is a sad comment on the gulf between theoretical and experimental population genetics that this paper seems almost out of place in the volume, purely because it is more concerned with realism than with precision.

J. F. Crow presents an extensive review of genetic loads, and Motoo Kimura reviews stochastic processes in population genetics. Kimura's review concentrates on diffusion approximations. A review by Henry Schaffer of work on branching processes and the survival of mutant genes complements Kimura's review by covering some of the work on the stochastic processes to which the diffusion equations are an approximation.

J. A. Sved and O. Mayo review recent theoretical work on the evolution of dominance. C. C. Li reviews segregation analysis of human sibship data, confining himself to the case of complete ascertainment of affected individuals. Kojima and Lewontin review linkage and epistasis in evolution.

If the reviews are highly useful, the original papers are fascinating. C. Clark Cockerham presents recurrence relations for inbreeding coefficients in systems of mating that avoid mating close relatives. His paper is an attempt to bring results in this area into a single picture.

Although there is no review paper covering quantitative genetics and animal breeding, two papers by W. G. Hill and Alan Robertson provide a view of the Edinburgh school at work. Hill and Robertson view animal breeding in terms of changes of gene frequencies at single loci, making extensive use of diffusion approximations. They are less interested in the gain from selection in one generation than in the ultimate probability of fixing favorable alleles in a line. Hill compares the effectiveness of different methods of selection by line-crossing. Robertson examines the effect of linkage on the gain from truncation selection when there are many loci. His paper is a demonstration of how far one can go beyond exact equations by a careful combination of approximations, computer simulation, and heuristic arguments.

Richard Levins provides the liqueur to this repast in a brief but important paper which is one of the first serious attempts to grapple with the problem of group selection.

In general, the quality of the contributions compensates for the high price of this volume.

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A Physical System

Three Body Problem in Nuclear and Particle Physics. Proceedings of an international conference, Birmingham, England, July 1969. J. S. C. MCKEE and P. M. ROLPH, Eds. North-Holland, Amsterdam, and Elsevier, New York, 1970. xii, 564 pp., illus. $32.

An ever-increasing number of theoretical and experimental papers has been published in recent years on various aspects of the three-body problem. Improved mathematical methods, such as Faddeev equations, improved computer technology, and new experimental techniques have given impetus to substantial research in this field. It was very fitting, then, that a conference be held to discuss the three-body problem. The proceedings of this conference, which was attended by some of the better-known workers in the field, contain 30 full-length articles and the abstracts of another 39 contributed papers. There are 16 theoretical and 11 experimental articles. In addition, three review papers, summarizing all avail-