stronger for invertebrate than for vertebrate neurosecretory systems. One of the most impressive aspects of this volume is that it shows that anyone studying peptide or amine secretion will find it valuable to consider results from any of the other systems. This conference and its memoirs are a major contribution which will help to further communication between groups working on these related vertebrate (and, one might hope, invertebrate) endocrine systems.

ALLAN BERLIND
Department of Biology,
Wesleyan University,
Middletown, Connecticut

Plasmodium and Its Hosts

The Primate Malarias. G. ROBERT COATNEY, WILLIAM E. COLLINS, MCWILSON WARREN, and PETER G. CONTACOS. National Institutes of Health, Bethesda, Md., 1971 (available from the Superintendent of Documents, Washington, D.C.). xii, 366 pp., illus. $7.

This long-awaited monograph on malaria parasites exceeds all expectations in the brevity and clarity of the text and the quality of the 27 colored plates. The authors went to great lengths to achieve uniformity in the preparation of the latter; all but two were painted by a single artist under their direct supervision from material stained by exactly the same technique, and all the illustrations are at the same magnification. The treatment of the subject is fundamentally zoological, but the malariological background of the authors is reflected in the concentration on the practical aspects of identification of species. Thus, most attention is paid to the morphology of the parasites in Giemsa-stained blood films. Nevertheless the diagnostic importance of the sporogonic stages is emphasized, and a unique feature is the inclusion of 18 plates, which trace sporogony from the earliest oocyst, in a series of figures, to the sporozoites. Less attention is paid to the details of exoerythrocytic schizogony (nine plates of photomicrographs in black and white illustrate the details) or the first stages of sporogony. Each species is described in a standard way: history and synonymy; developmental cycles of the parasite in the blood, mosquito, and liver respectively; the course of the infection; vertebrate and invertebrate hosts and immunity.

The first chapter comprises a highly original account of the evolution of the primate species of *Plasmodium*. It is suggested that the simplest explanation of the peculiar zoogeography of these parasites and their vertebrate hosts is that their cradle was sited in the jungles of southern Asia, where florid speciation of both parasite and host arose; then at a more recent date, perhaps in the early Pleistocene, an early hominid invaded this region from the west or north. He shared the same sylvatic environment and soon became infected with the indigenous parasites. Such events occur, albeit rarely, today, as the authors vividly describe from their own observations on the contraction of *P. knowlesi* malaria by an American surveyor who had spent a few days in the forest in Malaya. The zoonotic potential thus still exists. Speculations on the return of infected hominids to Africa and the late introduction of malaria into early man and the great apes in that continent seem less plausible, but no better theory has really been advanced. More certain, perhaps, is the theory of the introduction, only a few hundred years ago, of *P. malariae* and *P. vivax* into the New World, where these parasites spread not only to the human inhabitants but also to the monkeys, where they became adapted as *P. brasilianum* and *P. simium* respectively. A later chapter describes in more detail the present-day ecological relationship in the three continents regarding the transmission of primate malaria by sylvatic species of anopheline mosquitoes. The last introductory chapter is notable for a clear exposition of the nature of relapses and the various theories that have been suggested to explain the mechanism, but the complete picture is still missing.

Twenty-four species of *Plasmodium* are described in separate chapters which range in length from 30 pages (on *P. cynomolgi*, the most widely used experimental model) to little more than a single page (on *P. girardi* and *P. lemuris*, rare parasites of lemurs). The four species found in man receive considerable attention, and invaluable information is summarized here on the behavior of different strains, particularly of *P. vivax* and *P. falciparum*. Although, in general, clinical details are omitted from this book, symptomatology of these human infections is discussed in reference to types of fever and duration of the disease, largely on the basis of the authors' own observations on sporozoite-induced infections in patients requiring malaria therapy or, more recently, in prison volunteers. Many examples are taken from the literature also to illustrate special points of interest. The descriptions of the malaria parasites of Asian nonhuman primates are particularly good, because they embody the profound studies of the four authors, in the field, in experimental vertebrate and invertebrate hosts, and finally in man; incidentally, five of the species were discovered and named by one or more of the writers.

The book itself reveals throughout an intimate knowledge of the organisms. It is written in such excellent English that the nonspecialist can read it with interest and could quickly become familiar with the subject. The 73 figures and 41 tables relate chiefly to the course of parasitaemia and of sporogony, and show at a glance these important aspects of malaria in the primate and in the mosquito.

P. C. C. GARNHAM
Department of Zoology,
Imperial College of Science,
Ascot, Berkshire, England

Scattering Techniques

Theory of Thermal Neutron Scattering. The Use of Neutrons for the Investigation of Condensed Matter. W. MARSHALL and S. W. LOVESEY. Oxford University Press, New York, 1971. xxiv, 600 pp., illus. $38.50. International Series of Monographs on Physics.

This is a very timely and long-awaited book on thermal neutron scattering. Several reviews and monographs have appeared in recent years treating various aspects of neutron scattering for the study of basic properties of condensed matter. However, this is the first comprehensive theoretical treatment of thermal neutron scattering to cover all important applications of the technique.

As the authors state at the outset, thermal neutrons have a fortunate energy-wavelength relation (for example, 20 meV at 2 Å) which makes them ideal tools for the study of fundamental excitations in crystals, such as phonons and magnons. In addition, the normal cross-section for hydrogen permits wide applications to chemical and biological studies. Many strong sources of thermal neutrons are now available, and the neutron-scattering technique is now considered one of the basic tools in scientific research.

In this book, Marshall and Lovesey have succeeded in giving a systematic and lucid theoretical treatment of neu-