stages of the same parasite, as has been so long maintained by Laveran and numerous other observers of the French school. The incubation period of simple tertian malaria — that is, the period which elapses between the bite of an infective mosquito and the development of symptoms and the appearance of parasites in the peripheral blood—has been shown to vary between 9 and 22 days; and much has been learned regarding the clinical course of the disease.

In striking contrast to the cases of malaria which occurred in such enormous numbers during the War, and those with which one has to deal in the ordinary practice of tropical medicine, the general paralytics were readily cured of their induced malaria by a three-days course of quinine, and relapses were remarkably rare. Why this should be so is a question of no mere academic interest, but one of great practical importance and one to which my colleague, Dr. Scott Macfie, and I devoted much thought and work. As the result of a most careful analysis of all the facts available, the conclusion was reached that the remarkable susceptibility to treatment exhibited by the cases of induced malaria is bound up with the fact that in these cases one is concerned with the early treatment of the disease, or, in other words, with the treatment of primary infections.

In our opinion the train of events in the treatment of malaria is as follows: quinine given to a patient whose blood contains numerous malaria parasites invariably destroys—probably indirectly, *i.e.* after it has been changed in some manner by the human body —large numbers, but not all, of the parasites, and by this means sets free a considerable quantity of soluble antigen. The antigen provokes, by stimulation of the host's tissues, the formation of immune-body. The immune-body, if sufficient in amount, destroys the remaining parasites, thus resulting in sterilisation of the infection and in the cure of the patient. When, for any reason, the host is unable to produce immune-body in sufficient amount, the infection is not sterilised and a relapse occurs. We surmise that certain individuals are unable to produce a sufficiency of immune-body to sterilise the malaria infection, possibly owing to inadequate treatment at the time of the first attack, possibly owing to ill-health at the time of infection and treatment, or possibly owing to a personal idiosyncrasy. Whatever be the cause, these are the patients who develop into chronic relapse cases of malaria; such patients can no longer be cured by quinine, not because the parasites they harbour are quinine resistant, but because, owing to a defective formation of immune-body at the time of the initial attack and treatment, the parasites have not been completely destroyed and have gradually acquired an immune-body resistance. If this view be correct, it indicates the paramount importance of adequate quinine treatment at the time of the initial attack of malaria; a course of treatment which suffices to sterilise the primary malaria infection fails to prevent the occurrence of relapses when administered to a case of some standing, and this explains the complete lack of success which followed the most drastic efforts to sterilise the infection in the patients invalided with malaria to Great Britain during the War.

Whether the daily taking of quinine will protect from malaria those living in the Tropics, and subject to the bites of infected mosquitoes, is naturally a question of the greatest importance. Notwithstanding the enormous literature bearing on the subject, no precise information has hitherto been obtained, mainly owing to the great practical difficulties which surround any attempt to make observations from which it would be possible to draw conclusions free from very obvious fallacies. The present investigation has, however, provided the answer to this important question. Our observations showed that the administration of quinine before a person is bitten by an infected mosquito is useless, and that the drug has little if any action on the sporozoites injected by the mosquito. In order to prevent the malaria from developing, the administration of the drug must be continued for at least ten days after the feed of the infective mosquitoes; the daily dose of quinine given has but little influence apart from the fact that, with very large doses (30 grains), the period for which the drug has to be given to prevent development of the infection is a little shortened.

Obituary.

Dr. W. B. Hemsley, F.R.S.

WILLIAM BOTTING HEMSLEY, whose death, in his eighty-first year, took place at Broadstairs on October 7, was born at East Hoathly, Sussex, on December 29, 1843. A member of a family which had a long and honourable connexion with horticulture, Hemsley's knowledge of plants began with his knowledge of the alphabet. Being a somewhat delicate child he had to be educated privately, and before his education had been completed, in order to lead, so far as possible, an out-of-door life, he began his training as a gardener in his father's establishment. Already his taste for botanical pursuits was so marked that, as soon as his training had been completed, he entered Kew as a young gardener in 1860, when in his seventeenth year.

Before the period of two years to which the service of a young gardener at Kew is normally limited, Hemsley's remarkable botanical aptitude had so impressed both the Curator and the Director that he was transferred from the garden to the herbarium. Here young Hemsley's capacity attracted the attention of Mr. G. Bentham, who was then at work on his great "Flora Australiensis," in the preface to the first volume of which reference is made to Hemsley's services. While a temporary technical assistant in the herbarium, Hemsley gave all his spare time to general botanical studies; in 1863 he gained a first prize in botany, awarded by the Royal Society of Arts. In 1865 a vacancy occurred in the permanent herbarium staff, and Hemsley was selected to fill it. But Hemsley's physique could not stand the strain to which the enthusiasm and assiduity with which he performed the duties of Herbarium Clerk subjected it. In 1867 a complete breakdown in health compelled Hemsley, to the regret of his superior officers, to relinquish his clerkship and retire to Sussex. Here, in spite of his illness, Hemsley devoted himself to mastering Latin,

German, and French, and continued his botanical pursuits, the results of which were embodied in a "Handbook of Hardy Trees, Shrubs and Herbaceous Plants," still highly esteemed by gardeners, and in an "Outline of the Flora of Sussex," prized by local botanists. So high was the standard Hemsley had set himself and had attained, that in 1875 the Linnean Society elected him one of its botanical associates.

By 1874, Hemsley's health, though still indifferent, justified his return to Kew as an independent worker. During the next nine years he was engaged principally on the task of elaborating the phanerogamic material obtained during the cruise of the *Challenger*, and of describing the botanical collections of Messrs. Salvin and Godman. The *Challenger* report was published in 1885, and secured for Hemsley the position of a recognised authority on insular floras. The botanical work done on behalf of Salvin and Godman was published in the five botanical volumes of their great "Biologia Centrali-Americana," issued at intervals during 1879–1888; the extraordinary value of this Mexican flora was recognised, so soon as it was completed, by Hemsley's election to the Royal Society in 1889.

Meanwhile Hemsley's health had, happily, become completely restored, and in 1883 he once more was able to join the permanent staff of the herbarium at Kew as assistant for India. In 1890, when Prof. D. Oliver was succeeded by Mr. J. G. Baker as Keeper of the Herbarium and Library, Hemsley was appointed a principal assistant in succession to Mr. Baker, and in 1899, when the latter retired from the public service, Hemsley again succeeded Baker, and served as Keeper of the Herbarium and Library at Kew until his own retirement, at sixty-five, on December 28, 1908. While assistant for India and principal assistant, Hemsley was able to prepare his invaluable work on the flora of China, which occupies three entire volumes of the Linnean Society's Journal. During this period, too, he collaborated with Dr. J. E. T. Aitchison in working out the botanical results of the Afghan Boundary Commission, with Sir Henry Collett in doing the same for the Shan Plateau, and with Mr. H. H. W. Pearson in writing a valuable "Flora of High Asia." He was also the author of many smaller, but always important, botanical contributions, mainly of a systematic character. He took a share, with other members of the Kew staff, in the preparation of the "Flora of Tropical Africa," and assisted Sir Joseph Hooker, after his retirement in 1885, in connexion with the *Botanical Magazine*, which Sir Joseph continued to edit after he had ceased to be Director of Kew.

As Keeper of the Herbarium, Hemsley found his time very fully occupied with official duties, and although many minor contributions to botanical literature were still made by him, he wisely avoided undertaking any task so formidable as those accomplished in his earlier years of active work. After his retirement Hemsley continued this policy for another reason. He did not care to undertake a task he might not have strength to complete. His work on the matters he took up remained, however, as excellent as ever, and was continued until failing physical powers necessitated his seeking a home in a climate more bracing than that of the Thames Valley.

Hemsley's labours were appreciated as highly in other countries as in his own. His contribution to the "Biologia Centrali-Americana" brought him honorary membership of the Natural History Society of Mexico; his knowledge of insular floras brought him honorary membership of the Royal Society of New South Wales, and of the New Zealand Institute, and corresponding membership of the German Botanical Society. His services to garden-lovers brought him honorary membership of the Royal Horticultural Society and the award of its Victoria Medal of Honour. In 1896 the Linnean Society accorded him, at his own request, transfer from associateship to fellowship, and in 1918 the University of Aberdeen conferred on him the honorary degree of LL.D.

The courtesy and consideration which made collaboration with Hemsley as a botanical author as pleasant as it was profitable to those thus privileged, made the relationship between himself as Keeper and his colleagues in the Herbarium equally cordial. Not they alone, but all who ever came in contact with Hemsley will treasure the memory of one whom they esteemed for a kindness as genuine as his sincerity, for a knowledge as remarkable as his modesty.

LORD ABERCROMBY.

ARCHÆOLOGICAL circles in Scotland have lost one of their most distinguished figures by the death of Lord Abercromby, which took place at Edinburgh on October 7 in his eighty-third year.

John, fifth baron Abercromby of Aboukir and Tullibody, was born on January 15, 1841. He was a great-grandson of General Sir Ralph Abercromby, who died from wounds at the battle of Alexandria in 1801, and whose widow was created a baroness. Lord Abercromby succeeded to the title on the death of his brother in 1917. He was educated at Harrow, and for some years held a commission in the Rifle Brigade. After his retirement he took up the study of philology, folklore, and archæology. His publications were not numerous, but they were characterised by accuracy, scholarship, and judgment. Although not all of his conclusions have found acceptance, some of his views, especially those relating to the origin and distribution of Bronze Age types of pottery, have had a profound and widespread influence on the trend of archæological thought. One of the earliest of his publications was "A Trip through the Eastern Caucasus." Better known was his "Pre- and Proto-Historic Finns," in which he traced the history of the Eastern and Western Finns from neolithic times to the Middle Ages, analysed their religious beliefs and folklore, and translated their traditional magic songs. This valuable piece of work was recognised by election as an honorary member of the Finnish Archæological Society and the Finno-Ougrian Society of Helsingfors. His most important work, however, was his "Bronze Age Pottery of Great Britain and Ireland," which appeared in 1912; this was a gathering together and elaboration of the views which he had expressed in various scientific periodicals in the preceding ten years or more. A further notable contribution to the study of prehistoric ceramics appeared in the Journal of the Royal Anthropological Institute for 1914 under the title "The Prehistoric Pottery of the Canary Islands and its Makers."