versity and the Manchester Chamber of Commerce, will assist in securing the effective application of the results of scientific research in industry, particularly in the northwestern part of England, where cotton and heavy engineering are the most important industries. An information service has been created which aims not so much at furnishing scientific answers to the problems submitted but at placing the inquirer in touch with the organization best able to deal with the particular subject. Regular meetings of the Council are now held in the Manchester area, and the scientists and the facilities at Manchester University and Manchester College of Technology will be available, where appropriate, to industrial firms in the region. A similar scheme is now being instituted at Leeds.

Finally, university research into the functioning of financial and business institutions in Britain and elsewhere, and the economic conditions affecting them, is being encouraged by the fellowships and grants awarded by the Houblon Norman Fund, sponsored by the Bank of England.

It will have been observed that, in the development of these links between the universities and industry, there is no suggestion that the former should sacrifice their academic integrity, or be guided as to policy by industry, or, except in special circumstances, should put themselves at the disposal of industrial organizations. It cannot be doubted that in the long run the national well-being will be served by these schemes, and others which, no doubt, will follow, for interknitting more closely knowledge and manufacture.

Wartime Research in Malaria

The Board for the Coordination of Malarial Studies

AN EXTENSIVE PROGRAM of research in the chemotherapy of malaria has been developed during the last four years through the efforts of a large group of university investigators sponsored and supported by the Committee on Medical Research of the Office of Scientific Research and Development. This program, integrated with that of cooperating industrial firms, is closely coordinated with malarial investigations in the Army, Navy, and U. S. Public Health Service through the Board for the Coordination of Malarial Studies. The functions of the Board are administered through facilities of the National Research Council provided by a contract between the National Academy of Sciences and the OSRD.

Useful knowledge has been accumulated on the biology of various malarial parasites, on their biochemical requirements, and on their behavior in different hosts. Studies on immunity in the avian infections have yielded information on the cross-immunization which obtains with different species of parasites. The immune response of human subjects to malarial antigen has not shown promise, either in the prevention or modification of the disease or in the production of complement-fixing antibodies which might be useful in differentiating between a latent infection and a cure in *vivax* malaria.

The studies in the chemotherapy of malaria have involved the screening of over fourteen thousand compounds for various types of antimalarial activities in various avian infections, a study of the toxicology and pharmacology of many of these compounds in laboratory animals, and a study of the potentialities of about eighty in human malarias due to parasites of domestic and exotic origin. In the course of these investigations, the chemical and pharmaceutical industries have responded generously to requests for both small and large quantities of material for animal and clinical studies.

The net result of these investigations has been the discovery of antimalarial activity in compounds derived from a variety of structural types, and a clear definition of the problems involved in the suppression and cure of malaria. In addition, certain investigations have progressed to the point where the results have been of definite value in the treatment of malaria. The practical advances emanating from the program can be summarized in brief as follows:

(1) *The development of better methods for the use of quinacrine (atabrine) in the suppression and treatment of malaria, which led to the demonstration that this compound is superior to quinine.*[1] The development of an accurate specific method for the determination of the small amounts of quinacrine in plasma permitted the collection of information on the pharmacology of this drug in experimental animals and man, upon which was based a rational usage of the drug.

(2) *The development of compounds superior to quinacrine.* Among these are several members of the 4-aminoquinoline series. In this group, SN 7618,[2] *7-chloro-4-(4-diethylamino-1-methylbutylamino)quino-*

[1] Statement of the Board for the Coordination of Malarial Studies. *J. Amer. med. Ass.*, 1944, **125**, 977.

[2] The Survey number, designated SN, identifies a drug in the records of the Survey of Antimalarial Drugs.

line, has received the most extensive exploration, both in civilian and military establishments. This compound is an effective suppressive, when administered no more frequently than once weekly in a well-tolerated dose. It will also cause an abrupt termination of the clinical attack of *vivax* malaria and will cure *falciparum* malaria when administered for only one or two days. In addition, it does not discolor the skin as does quinacrine, nor does it give the disagreeable gastrointestinal symptoms which are sometimes seen with the administration of quinacrine. Several other compounds in this same chemical series would also appear to be superior to quinacrine. Promising compounds in other chemical groups are under study. However, investigations with compounds of the latter types have not reached the stage of field trial. It is therefore not possible to make any statement concerning their practical usefulness at this time.

(3) *The exploration of the 8-aminoquinolines.* During the past year the exploration of promising leads to suppressive drugs has been extended; however, the major emphasis has been focused upon the study of the 8-aminoquinolines with the hope of uncovering a nontoxic curative agent. This line of investigation received impetus from published reports of British investigators in the early 1930's on the prophylactic and curative actions of pamaquin (plasmochin) in *vivax* malaria. Clinical investigators under OSRD contracts reappraised these actions. They have now demonstrated a curative action of pamaquin in *vivax* malaria due to both domestic and Southwest Pacific strains of *P. vivax.* However, there would not appear to be a sufficient "spread" between the minimal effective and the maximal tolerated doses to warrant recommendation of its use at this time. Other 8-aminoquinolines are being explored with the hope of developing a compound with the curative action of pamaquin but without its concomitant toxicity.

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Association Affairs

Recent Elections of Officers for Terms Beginning in 1946

President (one-year term): James B. Conant, Harvard University

Members of the Executive Committee (four-year terms): C. F. Kettering, General Motors Research Laboratories; Fernandus Payne, Indiana University

Members of the Council (four-year terms): H. R. Aldrich, Geological Society of America; W. M. Krogman, University of Chicago

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Mathematics (A): R. E. Langer, University of Wisconsin

Physics (B): L. A. DuBridge, Massachusetts Institute of Technology

Chemistry (C): Henry Eyring, Princeton

Astronomy (D): G. VanBiesbroeck, Yerkes Observatory

Geology and Geography (E): John L. Rich, University of Cincinnati

Zoological Sciences (F): Alfred E. Emerson, University of Chicago

Botanical Sciences (G): E. C. Stakman, University Farm, St. Paul, Minnesota

Anthropology (H): Leslie Spier, University of New Mexico

Psychology (I): Sidney L. Pressey, Ohio State

Social and Economic Sciences (K): Frederick C. Mills, Columbia University

History and Philosophy of Science (L): Dorothy L. Stimson, Goucher College

Engineering (M): Henry T. Heald, Illinois Institute of Technology

Medical Sciences (N): Francis G. Blake, New Haven Hospital

Agriculture (O): M. A. McCall, U. S. Bureau of Plant Industry

Education (Q): Guy T. Buswell, Chicago