

The
Wellcome Trust
1974-76

Eleventh Report



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The Trustees' first meeting in the Board Room at 1 Park Square West, October 1974
L. to R.: Prof. H. Barcroft, Prof. R. H. S. Thompson, Dr. Edda Hanington (Deputy Secretary),
Dr. P. O. Williams (Secretary), Lord Franks, Lord Armstrong, Sir John McMichael,
Sir Michael Swann, Dr. C. E. Gordon Smith

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1974-76

Eleventh Report

1 Park Square West, London NW1 4LJ

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The Wellcome Trust

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The Wellcome Trust

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**The First 40 Years
of
The Wellcome Trust**

Sir Henry Wellcome died on 25th July 1936. The Wellcome Trust is therefore 40 years old. During this time it has allocated £34.5m for the support of medical research and medical history. Its growth is illustrated by the fact that during its first 20 years it distributed £1m, in the next ten years a further £8.5m and between 1966 and 1976 £25m. The Wellcome Trust is now the largest endowed charitable Trust supporting medical research in the United Kingdom and plays a significant role both in this country and the tropics.

The present strength of the Wellcome Trust is the result of the expansion of the international pharmaceutical company, The Wellcome Foundation Limited, which was founded by Sir Henry Wellcome and of which the Wellcome Trustees are the sole shareholders.

I INTRODUCTION AND POLICY

It is an essential requirement for every modern society that it should retain sufficient flexibility to be able to adopt new ideas and developments of importance. This necessitates the provision of opportunity, encouragement and continued appraisal of new people and new suggestions. Lack of such flexibility leads to a state of depression, so that new ideas are not put forward because it seems inevitable that they will not be financed.

For many years we have watched the steady growth in expenditure on the Health Service, the Universities and the Research Councils although a closer look suggests that because of inflation much of this growth is more apparent than real. Nevertheless, until recently, within the budgets of these bodies there has always been the opportunity for new developments. During such a growth phase it did not, on the whole, cause concern that health care, higher education and research had largely developed into government financed monopolies.

During the past year the situation has changed. The Universities, the Health Service and the Research Councils have ceased to grow and in most cases, because of inflation, there has been an effective reduction in their resources. The result has been that the Universities have had to cut back on their staffing and running costs so as to keep within their budgets. The number of new posts becoming available in academic medicine is therefore small and such as occur are inevitably related to the requirements of patient care and teaching. In the past, a deficiency of this kind might have been cushioned by a transfer of funds from the Health Service or the Medical Research Council. Such alternatives are no longer readily available. The overall effect on those in post is mainly of significance because they have to spend more of their time, since fewer colleagues are available, on clinical work, teaching and administration and hence less on the pursuit of innovation and research. The impending shortage of Government funds for running expenses and technical assistance for research work of high quality will

make it even more difficult for university staff to undertake research. The virtual cessation of the provision of equipment grants will, in due course, create real difficulties especially as costs rise. This is the general situation which we can anticipate will continue for several years.

It has perhaps not been surprising that the growth which we have seen for many years should cease and so we should, in any case, have had to learn to deal with the situation that now exists. Unfortunately the growth period has not been sufficiently long to reach the position where retirement will create enough vacancies for a reasonable level of recruitment. The pressure on the Medical Research Council to economise and to give permanent appointments to its staff has also resulted in a reduced number of posts becoming available. Opportunities are very limited for young men and women who may be considering making their future in academic medicine. Not only are suitable posts in short supply, but so also are the financial rewards which are relatively much less good for university staff than those in the Health Service. Despite these deterrents to a career in academic medicine, there are still young men and women who are so enthusiastic about the importance and interest of medical research that they are prepared to accept the risks in their career prospects and make financial sacrifices so as to pursue their ideas. The attractions of posts overseas once more become highly significant. The position is inevitably more difficult for those without a medical qualification, as the alternative of a clinical appointment in the last resort is not available.

We have therefore reached a no-growth situation when medicine and higher education are largely a monopoly of government.

Charitable funds provide an alternative but the quantity clearly can never be sufficient to have a major impact on the general situation. However, focused on particular problems, private funds have a special opportunity to assist in preserving the high quality of British academic medicine just when it is needed.

The Wellcome Trust has carefully considered its policy in the light of present events. It has found that the suggestion made in its last report that Trust funds should be used to help Universities to develop their own innovative plans did not receive the response that might have been anticipated. The reason, apparently, was the inability of the Universities to plan new developments in such a shifting situation. It was as much as they could do to keep within their budgets.

During the past two years, the Trustees have been very conscious of these and other factors that are having an adverse effect on medical research. In order to keep themselves informed, they have held numerous informal consultations with individuals and groups in the Universities and with organisations such as the Committee of Vice-Chancellors, the University Grants Committee and the Medical Research Council. They have also kept in touch with the world of Foundations and Charities through the Standing Conference of Medical Research Charities. In addition, they held two meetings in which every university medical school participated to obtain views on the present problems and likely requirements for the future. Dr. Williams personally visited the Universities of Oxford, Cambridge, Birmingham, Bristol and Dundee and the Medical Schools of St. Mary's, Charing Cross, King's, St. Thomas's, the Royal Postgraduate Medical School and the London School of Hygiene and Tropical Medicine for discussions on Research Policy at meetings of Departmental Heads and others. He also saw the Deans or other representatives of most of the other medical schools. The results of all these contacts were brought together at two major policy meetings of the Trustees held in July 1975 and May 1976. At these meetings, the Trustees examined their policy on a variety of topics and decided how best to allocate their resources for the future. In December 1975 they published a policy statement for 1975-76 (Appendix I).

For 1976-77 a choice has had to be made between the deliberate support of specific objectives and the *ad hoc* selection from the range of applications that are presented to the Trustees for consideration. The budget which follows shows that the Trustees have decided to pursue a more

selective policy. New Fellowship schemes have been established in the Basic Biomedical Sciences, Pathology and Mental Health to complement those already available for Clinical and Veterinary medicine and for interchange with Europe.

Continued emphasis has been placed on interdisciplinary linkage between the basic sciences and clinical medicine, both in fellowship schemes and in *ad hoc* awards. Four specific areas have been selected for substantial support in 1977. These are: ophthalmic medicine, the vascular system of the human brain in relation to disease, the metabolic effects of infection, and the pathology of trauma. The Trustees consider these topics to be in need of special encouragement not only because of their importance for medicine but because of their relative neglect at the present time.

The Trustees have also continued their interest in the support of research in Tropical Medicine and Mental Health and have established Advisory Panels for both these subjects.

The result of these new developments, despite the increase in funds available to the Trust, is that there has been no increase in funds available for projects submitted for *ad hoc* consideration by the Trustees.

The History of Medicine Advisory Panel has continued to advise the Trustees in that field. During the past two years much time has been spent over the transfer on loan of the Wellcome Museum Collection to the Science Museum and in arrangements for association of the Wellcome Institute for the History of Medicine with University College London. These proposals have now been agreed and will start to come into effect in 1977.

With these priorities in mind, the Trustees have decided to allocate the funds available to them in the following categories for 1976-77; a new list is prepared each year:

| | £ |
|--|------------------|
| Selected Subjects | 1,725,000 |
| Interdisciplinary projects | 500,000 |
| Mental Health | 350,000 |
| Veterinary Medicine (grants) | 200,000 |
| Tropical Medicine (grants) | 325,000 |
| History of Medicine (grants) | 50,000 |
| Other special subjects: | |
| Ophthalmic medicine | |
| The vascular system of the brain in relation to disease | |
| Metabolic effects of infection | |
| The pathology of trauma | |
| | } 300,000 |
| Special Fellowships | 1,150,000 |
| Wellcome Senior Research Fellowships in Clinical Science | 300,000 |
| Wellcome Senior Research Fellowships in Basic Biomedical Sciences | 250,000 |
| Surgical Fellowships | 100,000 |
| Pathology Fellowships | 60,000 |
| Tropical Fellowships | 140,000 |
| Veterinary Fellowships and Scholarships | 100,000 |
| Research leave scheme | 100,000 |
| Linked Fellowships | 100,000 |
| <i>Ad hoc Grants</i> | 1,040,000 |
| Clinical Sciences | 350,000 |
| Basic Sciences | 400,000 |
| Europe and other overseas awards | 200,000 |
| Travel Grants | 40,000 |
| Small Grants (non-Tropical) | 50,000 |
| Recurring Commitments | 1,020,000 |
| Wellcome Institute for the History of Medicine | 400,000 |
| Wellcome Units for the History of Medicine | 65,000 |
| Science Museum Fund | 30,000 |
| Tropical Units | 175,000 |
| Salary Awards | 350,000 |

In order that they can make as great a contribution as possible to help with the general situation which we have described, the Trustees have been concerned to increase the income of the Trust. Fortunately the last two years have seen strong growth by the Wellcome Foundation and a commensurate increase of profits. With the consent of the Treasury, the Foundation has been able significantly to increase the amount it distributes to the Trust. Of course this increase, important though it is, suffers erosion from inflation. A simple illustration is that during the two years covered by this report, £1,347,487 has had to be allocated for increases in the salaries of people supported by the Trust.

During this difficult time for medical research in Britain it is encouraging to know that the Trust will be able to provide increasing support from the larger funds now becoming available to it. The income for 1976-77 will be approximately £5½m.

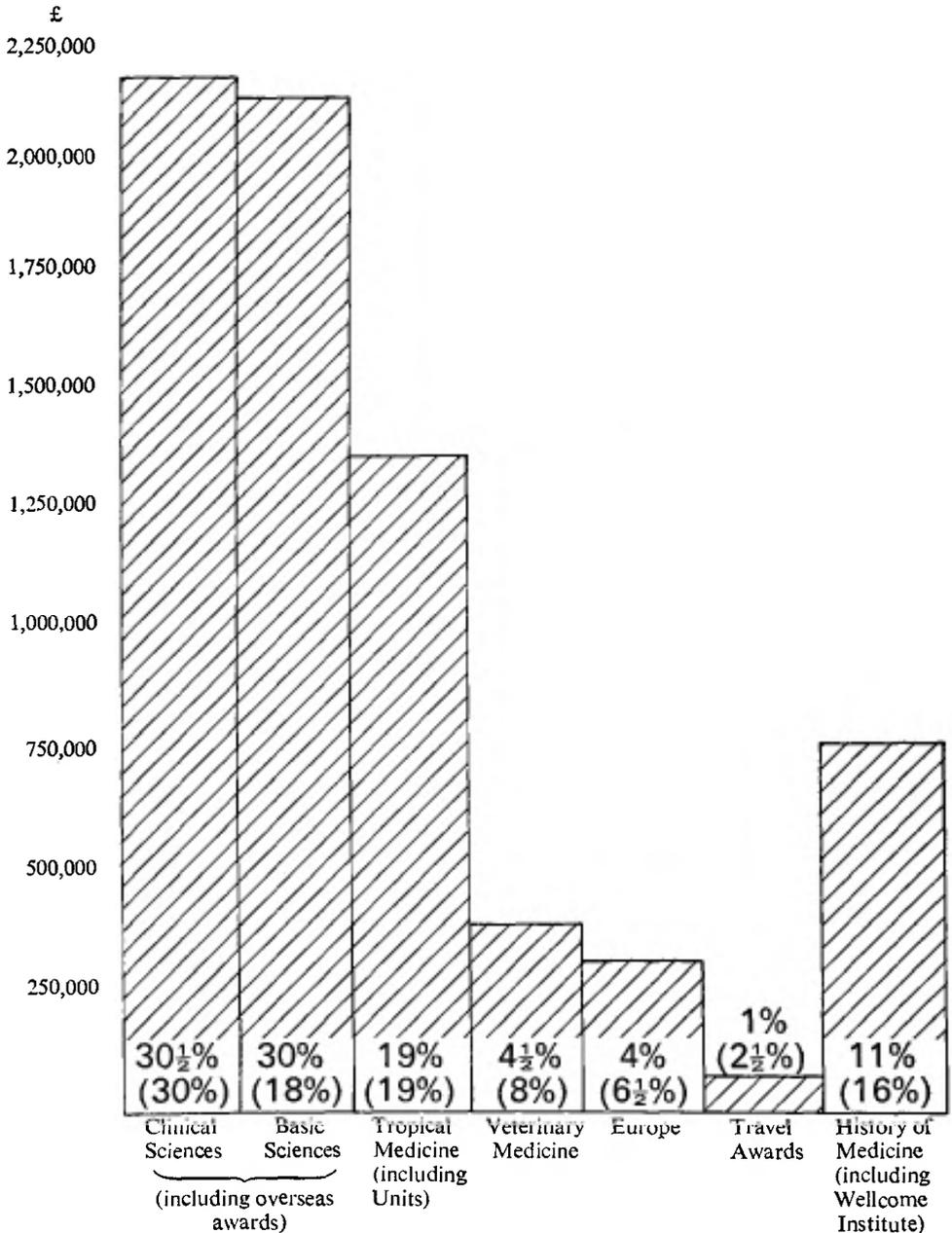
II GRANTS PROGRAMME

During the period under review the Trust has allocated £8,587,891 for the support of research in human and animal medicine. Of this sum £1,347,487 was to meet the cost of salary increases for grants previously awarded. The allocation for 1972-74 was £4,478,705, giving an increased allocation for new projects of £2,761,699.

The Table (Fig i, p. 14) and diagram (Fig. ii, p. 15) show how these funds have been allocated. The two major changes from 1972-74 are the increased proportion of funds provided for research assistance and for the support of the basic sciences. Since research assistance grants are the normal method of supporting the basic sciences, these changes are probably inter-related. Comments on the support of particular subject fields are given below in the appropriate sections.

Allocation of Funds 1974–1976 (Fig. ii)

Funds allocated for new projects 1974–76. (% for 1972–74 are given in brackets)



A. SUPPORT OF MEDICAL RESEARCH IN GREAT BRITAIN

UNIVERSITY DEVELOPMENT

The grants that are listed and described under this heading have been accorded special priority by the Trustees as those arising from the particular problems of research financing at the current time.

Departmental Support

The projects in this category have been supported specifically in order to enable the departments concerned to initiate new developments or to provide support for outstanding research workers where the university is unable to take on the initial responsibility. The Trustees provided approximately £225,000 for this purpose. The following notes about some of the projects listed in this section give an idea of the the type of programme the Trustees considered suitable for these awards.

The Trustees have supported Professor R. H. T. Edwards for a number of years, first as a Wellcome-Swedish Fellow and then as a Senior Research Fellow at the Royal Postgraduate Medical School. They were therefore very pleased when he was appointed to succeed Professor C. E. Dent in charge of the Metabolic Group at University College Hospital. His work on muscle metabolism through studies of the biochemical changes in biopsy specimens has created significant advances in this field. The present award is to enable him to take his closest collaborator with him to University College Hospital when he moves.

A major grant has been made to the Royal Postgraduate Medical School, Hammersmith, to further the development of laboratory-based academic research in immunology, on the appointment of Dr. J. H. Humphrey to the Chair of Immunology. Dr. Humphrey is one of the leading immunologists in this country who has spent most of his scientific life at the National Institute for Medical Research, Mill Hill.

The Trustees were especially interested in the proposal that he should now work on more clinical problems at Hammer-smith. He and his colleagues will study the immune response in pregnancy, by an investigation of histocompatibility antigens, and the materno-foetal transfer of antigen responsiveness. Another important study, on the immunopathology of malaria, is designed to throw light on the nature of the immune mechanisms which mediate cerebral damage under certain conditions.

The Trustees provided support to enable Dr. D. Chapman, an internationally recognised authority in the cell membrane field, to take up a senior post in the Department of Chemistry at Chelsea College. Many disease processes, including neurological diseases such as multiple sclerosis, cancer, aspects of immunology, effects of toxins such as tetanus and cholera, are considered to be related to the cell surface and cell membrane. Many drug actions are also thought to take place at the cell membrane. Dr. Chapman will be using physico-chemical techniques in his investigations of these conditions.

Professor K. E. Webster has received Trust support at University College for a number of years and the Trustees have been very impressed by the high quality of his work on the neuromuscular junction. On his move to King's College, London, they agreed to provide a grant to enable his collaborator, Dr. Colin Stolkin, to move with him.

Dr. D. Chapman, Department of Chemistry, Chelsea College, University of London:
Support for Dr. Chapman at Readership level for up to five years, to undertake research into cell membranes and disease processes.

Professor Barbara Clayton, Department of Chemical Pathology, Hospital for Sick Children, London:
Support for Dr. P. D. Whiteman for two years, to study the biochemistry of connective tissue disorders.

Professor R. H. T. Edwards, Department of Medicine, University College Hospital, London:
University Award for Dr. D. A. Jones as a Senior Lecturer for five years, to study the physiology and biochemistry of skeletal muscle.

Professor J. H. Humphrey, Department of Immunology, Royal Postgraduate Medical School, London:

Support for two academic staff members, Dr. B. Williams and Dr. C. Stern, for up to five years, to study the immunopathology of malaria and the immune response in pregnancy.

Professor K. E. Webster, Department of Anatomy, King's College, University of London:

University Award for Dr. C. Stolkin for three years, to undertake an analysis of nerve terminal sprouting at the vertebrate neuro-muscular junction.

Interdisciplinary Linkage

INTERDISCIPLINARY PROJECTS

Early in 1974 the Trustees decided to extend their scheme for promoting interdisciplinary linkage by offering grants for up to five years to enable medical schools to initiate new interdisciplinary projects for which the school would accept the future responsibility by redeploying their budgets. During the past two years over £400,000 has been provided for this purpose. The programmes described below serve to illustrate how a combination of disciplines can often help in the solution of problems. The scheme enables expertise in technical and basic science fields to be introduced more easily into the clinical situation.

A grant to Professor I. A. Boyd and Professor J. Lamb of Glasgow University will enable them to extend their studies on the physiology of the muscle spindle, by launching an interdisciplinary project between the Departments of Physiology and Engineering. The two departments will use their expert knowledge to examine preparations of isolated muscle spindles. Their investigations necessitate the construction of models of the muscle spindle in engineering terms. Such models have not previously been features of attempts to place spindle physiology on a quantitative footing.

At the London Hospital Medical College an interdisciplinary project grant has enabled Dr. D. L. Wingate, Senior Lecturer in Physiology, to be appointed to a new post in the Department of Gastroenterology. Dr. Wingate is carrying out research in two main areas of gastrointestinal pathophysi-

ology: the electrophysiology of the intestine, and intestinal absorption and malabsorption. Electrophysiological studies in man have hitherto been limited by technical problems, which Dr. Wingate and his colleagues are overcoming by the development of apparatus which can be used in human subjects without hazard to the patient.

A good example of the way in which the Trustees have been able to implement their policy in this area is shown in the major award made to St. Mary's Hospital Medical School where interdisciplinary collaboration has been undertaken for many years. Proposals were put to the Trustees for the development of biochemical pharmacology. The interests of the Department of Biochemistry under Professor R. T. Williams were always in this area and the first step towards the establishment of a separate department was taken when a Chair and appropriate laboratory space were provided for Dr. R. L. Smith. The activities of this new Department of Biochemical Pharmacology and the teaching programme are co-ordinated with the Department of Pharmacology. Close links with the Department of Clinical Pharmacology are also being fostered. By providing research staff, technical help and expenses as well as an equipment grant, the Trustees assisted this interdisciplinary collaborative development between the basic science and clinical departments. The research programme is centred chiefly on studies on hypertension and also on the neuropathy of acute intermittent porphyria.

A major grant to Dr. N. R. Saunders and Dr. E. O. Reynolds of the Departments of Physiology and Paediatrics, at University College, will facilitate their studies in basic and applied developmental neurobiology. Their basic investigations are into the development of the blood-brain and blood-cerebrospinal fluid barrier mechanisms. Their clinical studies are into intraventricular haemorrhage in the pre-term infant.

Professor R. G. White, Department of Bacteriology, and Professor A. S. G. Curtis, Department of Cell Biology, at Glasgow University, are studying abnormalities of lymphocyte traffic, and their possible effects on the pathogenesis of

various disease states, particularly those where non-specific functions may be deranged. They hope to make advances towards a fundamental understanding at the cellular level of these defects, and to apply newly-developed cell biological techniques and concepts to clinical problems.

Professor I. A. Boyd, Institute of Physiology and Professor J. Lamb, Department of Electrical Engineering, University of Glasgow:

Research and technical assistance, expenses and equipment for three years, to correlate the sensory output of the muscle spindle with its motor input.

Professor K. W. Cross, Department of Physiology, Professor D. Ritchie, Department of Surgery, and Dr. J. E. Lennard Jones, Department of Gastroenterology, London Hospital Medical College:

Support for a consultant senior lecturer for five years, to study the electrophysiology of the intestine and intestinal absorption and malabsorption.

Professor C. J. Dewhurst, Professor M. Sandler and Dr. P. J. Lewis, Institute of Obstetrics and Gynaecology, Queen Charlotte's Hospital, London:

Grant to purchase equipment, to investigate hypertension in pregnancy.

Professor R. Hall, Department of Medicine (Endocrinology), and Professor A. L. Latner, Department of Clinical Biochemistry, The Medical School, University of Newcastle upon Tyne:

Support for Dr. B. R. Smith for five years at Senior Lecturer level, to develop radio-immuno and radio-receptor assays in the study of the thyroid.

Dr. Lesley Rees, Department of Chemical Pathology, St. Bartholomew's Hospital, London:

University award over five years, for studies in endocrine pathology.

Dr. N. R. Saunders, Department of Physiology, and Professor E. O. R. Reynolds, Department of Paediatrics, University College London:

Research assistance, equipment and expenses over five years, for studies in basic and applied developmental neurobiology.

Professor S. J. G. Semple, Department of Medicine, and Professor E. Neil, Department of Physiology, Middlesex Hospital Medical School, London:

Salary and expenses of a joint lecturer in the Departments of Medicine and Physiology for three years, to study the chemical control of respiration.

Professor R. L. Smith, Department of Biochemical and Experimental Pharmacology, Professor R. T. Williams, Department of Biochemistry, and Dr. A. Gorchein, Department of Medicine, St. Mary's Hospital Medical School, London:
Grant to provide a Lecturer post, equipment, research assistance and expenses over five years for an interdisciplinary research programme into drug pharmacokinetics and metabolism, particularly in relation to hypertension.

Professor R. G. White, Department of Bacteriology and Immunology, and Professor A. S. G. Curtis, Department of Cell Biology, University of Glasgow:
Research and technical assistance, expenses and equipment for three years, to study the abnormalities of lymphocyte traffic and positioning, and their possible effects in the pathogenesis of disease.

INTERDISCIPLINARY LINKED FELLOWSHIPS

Representatives of university departments at two meetings held by the Trust endorsed the interdisciplinary linked fellowship scheme in which workers in the basic sciences can study clinical problems while retaining their status in the basic science department. During the past two years the Trustees have awarded 14 linked fellowships amounting to approximately £175,000. As will be seen from the grants listed, these fellowships cover a wide range of basic science and clinical subjects.

Dr. Gillian Adey, Department of Biochemistry and Department of Anaesthetics, University of Aberdeen:

Linked fellowship for three years, to investigate the effect of volatile and gaseous anaesthetic agents on certain enzymes with hydrophobic active centres.

Mr. T. S. Baker, Steroid Unit, Department of Biochemistry and Department of Obstetrics and Gynaecology, Middlesex Hospital Medical School, London:

Linked fellowship for three years, to investigate the application of radio-immunoassay in the field of human reproduction.

Mr. C. Berry, Department of Biochemistry and Department of Medicine, Royal Free Hospital School of Medicine, London:

Linked fellowship for three years, to study the defect in UDP-glucuronyl transferase in subjects with non-haemolytic unconjugated hyperbilirubinaemia.

Dr. D. J. Head, Department of Physiology and Department of Anaesthetics, University of Glasgow:

Linked fellowship for three years, to study the effects of the ventilatory response to carbon dioxide of activity of the limb muscles.

Dr. S. Leeman, Department of Medical Physics and Department of Diagnostic Radiology, Royal Postgraduate Medical School, London:

Extension of his linked fellowship for seven months, to study the use and development of ultrasonic techniques in diagnostic medicine.

Dr. M. J. C. Lemon, Department of Pharmacology and Department of Medicine, Medical School, University of Bristol:

Linked fellowship for three years, to study excitation-secretion coupling in exocrine glands.

Dr. K. Lindsay, Department of Physiology and Department of Neurosurgery, Institute of Physiology, University of Glasgow:

Linked fellowship for three years, to study the action of neck reflexes on the neck musculature.

Mr. J. C. McGrath, Department of Pharmacology and Department of Anaesthetics, University of Glasgow:

Extension of his linked fellowship for one year, to study the changes of activities of the autonomic nervous system during anaesthesia.

Dr. T. A. Moreland, Department of Pharmacology and Therapeutics and Department of Child Health, University of Dundee:

Linked fellowship for three years, to study drug metabolism in children.

Mr. R. D. Newell, Department of Physical Chemistry, Chelsea College, University of London and Department of Oral Medicine and Pathology, Gny's Hospital, London:

Linked fellowship for three years, for a microcalorimetric study of the metabolism of *Candida albicans*, and factors affecting inhibition of growth by anti-fungal agents.

Dr. J. S. Owen, Department of Biochemistry and Department of Medicine, Royal Free Hospital School of Medicine, London:

Linked fellowship for three years, to study membrane composition and function in relation to the plasma lipoprotein abnormalities of liver disease.

Mr. D. Rose, Department of Anatomy, University of Bristol and the Burden Neurological Hospital and Institute, Bristol:

Linked fellowship, expenses and equipment for three years, to investigate the relationship between brain GABA and visual perception, with particular application to the actions of anti-convulsant drugs in epileptic patients.

Dr. H. Selhi, Department of Biochemistry, Chelsea College, University of London and Department of Haematology, Royal Postgraduate Medical School, London:

Linked fellowship for three years, to study the structure and function of red cells in a variety of genetically determined red cell disorders.

Mrs. Ann Unseld, Department of Chemical Pathology and Department of Paediatrics, Charing Cross Hospital Medical School, London:

Linked fellowship for two years, to study the metabolism of UDP galactose and UDP glucuronic acid in infants with neonatal jaundice.

Research Leave

This scheme was announced during 1975–76. The intention is to allow established members of departments to concentrate on their research; these awards are normally for one year only. The Trust finances a temporary post so that the Fellow

can be relieved of his teaching and administrative duties. The Trustees are surprised that this scheme has not been greeted with more interest by the universities. £25,000 has been allocated up to September 1976.

Dr. M. J. Brueton, Institute of Child Health, University of Birmingham:

Research leave fellowship for one year, to study the isolation and function of intra-epithelial lymphocytes.

Dr. P. Cohen, Department of Biochemistry, University of Dundee:

Research leave fellowship for three years, to investigate enzyme activity in glycogen metabolism.

SUBJECTS SELECTED FOR DEVELOPMENT

Dermatology

Seven years ago the Wellcome Trust decided that Dermatology was a neglected subject from the point of view of research. Since then the Trustees have allocated £750,000 for the promotion of research and research training in this field. At their policy meeting in May 1976, the Trustees agreed that they should now cease to regard Dermatology as a subject selected for development. They came to this decision because they considered that they had given sufficient help to initiate new developments which might hopefully now continue under their own impetus. They felt, however, that there is still a lot more to be done to increase academic activities in this field. They will therefore continue to give occasional grants for specific projects and to help in other ways.

When the Trustees examined this field they found that one of the chief problems was the lack of an adequate career structure in academic dermatology. They therefore based their programme on the development of two institutions, one at the University of Newcastle and the other at the Institute of Dermatology, London. In both places the Trustees have provided substantial funds for building research accommodation. Under the direction of Professor S. Shuster and Professor C. D. Calnan (now succeeded by Professor Malcolm Greaves), they established programmes for the research training of new recruits to Dermatology. Eight training fellowships have been awarded under this scheme.

A particularly welcome development has been the establishment of Lectureships in Dermatology at Cardiff and Bristol, the holder of one of these posts having been trained under the scheme. The Trustees provided some of the funds for the initial appointments, the cost of which will in due course be taken over by the universities.

During the period under consideration, a special grant was made to enable Dr. R. Eady to establish a Unit of

Electronmicroscopy at the Institute of Dermatology. A research training fellowship was provided for Dr. R. Hay who is undertaking comparative studies in skin mycology at Guy's Hospital and at the Institute of Dermatology.

In addition to these specific developments, substantial research grants have been provided for work in this field at other institutions: for example, to Dr. L. Fry, St. Mary's Hospital, London, and to Dr. W. Frain-Bell, University of Dundee, for research on photobiology.

The Trustees now look forward to a period in which they may expect this subject to become more academic, with a consequent increase in our understanding of the aetiology and treatment of the extremely prevalent conditions that affect the skin.

£282,500 was allocated during 1974-76 for the support of research programmes in Dermatology.

CAPITAL GRANTS FOR BUILDINGS

Dr. W. Frain-Bell, Department of Dermatology, Ninewells Hospital, University of Dundee:

Building costs for research on the photobiology of the skin.

Professor M. W. Greaves, Institute of Dermatology, London:

Building conversions, to establish a skin pharmacology unit.

RESEARCH EQUIPMENT

Professor I. A. Magnus, Institute of Dermatology, London:

To purchase equipment, to provide portable instrumentation for radiation measurement and for spectral reflectance.

Dr. R. Marks, Department of Medicine, Welsh National School of Medicine, Cardiff:

Equipment to study the growth and metabolism of the epidermis in ichthyotic disorders.

Dr. R. Marks, Department of Medicine, Welsh National School of Medicine, Cardiff:

Equipment to investigate epidermal structure and function.

WELLCOME RESEARCH TRAINING FELLOWSHIPS IN DERMATOLOGY

Dr. J. Bem, Department of Dermatology, The Royal Victoria Infirmary, Newcastle upon Tyne:

Extension of his Wellcome Research Training Fellowship for one year, to complete a study of the control of epidermal growth and division in health and in psoriasis.

Dr. A. J. Francis, Department of Medicine, Welsh National School of Medicine, Cardiff:

Wellcome Research Training Fellowship in Dermatology for one year, to study the dermal influence on epidermal proliferation.

Dr. R. J. Hay, Department of Dermatology, Guy's Hospital, London:

Wellcome Research Training Fellowship in Dermatology for three years, to study dermatological mycoses with special reference to host and fungal factors determining invasion and individual susceptibility.

Dr. I. G. Ralfs, Department of Dermatology, University of Liverpool:

Wellcome Research Training Fellowship in Dermatology for three years, to study histocompatibility determinants in systemic lupus erythematosus with special reference to the clinical course.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Professor A. S. Breathnach, Department of Anatomy, St. Mary's Hospital Medical School, London:

Research expenses for three years, to undertake ultrastructural studies of skin and other tissues.

Dr. J. L. Burton, Department of Dermatology, United Bristol Hospitals:

Research expenses for one year, to study the relationship between androgens, coronary thrombosis and the skin.

Dr. L. Fry, Department of Dermatology, St. Mary's Hospital London:

Research assistance and expenses for three years, to study immune complexes in dermatitis herpetiformis and coeliac disease.

Professor M. W. Greaves, Department of Electron Microscopy, Institute of Dermatology, London:

Research assistance for two years, to study the structure/function relationships of human skin mast cells in inflammatory skin diseases.

Dr. Edna Laurance, Mitosis Research Laboratory, Birkbeck College, University of London:

Technical assistance for eighteen months, to study systemic factors influencing epidermal mitosis.

Professor P. F. D. Naylor, Department of Anatomy, St. Thomas's Hospital, London:

Technical assistance and research expenses for two years, to study the localisation and development of skin lesions.

Dr. W. C. Noble, Department of Bacteriology, St. John's Hospital for Diseases of the Skin, London:

Technical assistance and expenses for three years, to investigate the genetics of *Staphylococcus aureus* in relation to cutaneous ecology.

Dr. T. W. E. Robinson, Department of Dermatology, University College Hospital, London:

Technical assistance and expenses for one year and three months, to study herpes simplex virus using mouse skin as an experimental model.

Professor S. Shuster, Department of Dermatology, University of Newcastle upon Tyne:

Research assistance and expenses for one year, to continue research into psoriasis.

Professor S. Shuster, Department of Dermatology, University of Newcastle upon Tyne:

Research and technical assistance for two years, for an interdisciplinary investigation to define the mechanism of psoriasis.

Mental Health

Two years ago the Trust held a meeting to explore the possibilities for fostering closer collaboration between the basic sciences of pharmacology, physiology, biochemistry, neuropsychology and clinical studies of the nervous system. At that meeting it was agreed that new initiatives were needed if research into mental disorders was to be expanded. Full use should be made of trained people in related fields. This might be achieved by relieving them of some of their routine work or by giving them a period of sabbatical leave. In particular, the need to encourage recruits to neuropathology was emphasised.

As a result of this advice, the Trustees selected two fields for specific support. These were neuropsychopharmacology and neurobiochemistry. They then decided to explore more fully the suggestion that they might support one specific disease. With this in mind, they arranged a joint meeting

with the Nuffield Foundation in May 1975, to define opportunities for biomedical and social science studies of schizophrenia with a view to establishing a bridge between them. It was decided to consider the case of schizophrenia because of its importance, as this condition affects one per cent of the population. Those who suffer from it occupy one in five of the total hospital beds in the country (50 per cent of the beds in mental hospitals). It became apparent at the meeting that there is a need for a clearer definition of this disorder and that there is a real opportunity for results to be achieved through closer links between social, clinical and basic research workers.

The meeting also highlighted the need to attract recruits into these fields of research. Emphasis was placed on the importance of developing research in Departments of Psychiatry in the undergraduate medical schools so that students would consider the opportunities provided by psychiatry. It was also thought important to create appointments to bridge the gap between basic sciences and clinical psychiatry and to provide support for training suitable workers. Based on the background of knowledge provided by these meetings, the Trust decided to adopt a new approach to the support of psychiatry.

In January 1976 the Trustees advertised a competitive award for research into mental disorders, totalling £100,000, over a period of up to five years. They named neuro-psychopharmacology and neurobiochemistry as two areas in which they would like to see increased research and stated that priority would be given to work on schizophrenia.

The advertisement attracted over 60 letters of enquiry and 29 preliminary proposals were subsequently submitted. With the help of independent assessors, two of these proposals were selected for further consideration.

The groups concerned submitted detailed programmes and were asked to attend an interviewing board, who were impressed by both proposals and decided to recommend that the award of £100,000 should be shared between them.

The recipients are:

GROUP 1

Dr. J. A. Edwardson, Senior Lecturer in Physiology, St. George's Hospital Medical School, London, and Dr. H. R. Morris, Lecturer in Biochemistry, Imperial College of Science and Technology, London, in collaboration with Dr. T. J. Crow, Head of the Division of Psychiatry, Clinical Research Centre, Northwick Park, London:

An exploratory study of cerebral peptides in cerebrospinal fluid, blood, urine and post-mortem brain tissue from schizophrenic and control subjects to establish whether there are changes in the functioning of peptidergic systems involving known or novel compounds of this class.

GROUP 2

Dr. J. L. T. Birley, Dean and Consultant Psychiatrist, Professor C. D. Marsden, Head of the Department of Neurology, and Dr. R. Rodnight, Reader in Biochemistry, Institute of Psychiatry, London:

An investigation of the hypothesis that some aspects of psychotic behaviour may be due to abnormal metabolism of indoleamines in the brain with secondary effects on dopaminergic activity.

On the assumption that the lack of recruits into academic psychiatry results partly from a lack of interest in the field at undergraduate level, discussions were held with three heads of Departments of Psychiatry in the teaching schools. As a result of this, the Trustees have provided support to enable Professor Gerald Russell to undertake a scheme to train medical students in methods of psychiatric research that are derived from the basic sciences. The Trustees will follow the development of this programme with great interest.

The Trustees have decided to appoint a Mental Health Panel to advise them on their future support in this field (see page 137).

£300,700 was allocated for Mental Health during the period under review.

UNIVERSITY AWARDS

Professor G. Russell, Department of Psychiatry, Royal Free Hospital School of Medicine, London:

Support for Dr. A. Wakeling at Senior Lecturer level, secretarial assistance and recurrent expenses for three years, to train medical students in methods of psychiatric research that are derived from the basic sciences.

Professor Sir Martin Roth, Department of Psychological Medicine, The Medical School, University of Newcastle upon Tyne:

Support for a clinical Lecturer post for Dr. C. Q. Mountjoy over five years for neuro-pathological studies in psychiatry.

VACATION SCHOLARSHIP

One vacation scholarship was awarded.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Dr. D. A. Bender, Courtauld Institute of Biochemistry, Middlesex Hospital Medical School, London:

Research assistance and expenses for two years, to study abnormalities of serum tryptophan levels in chronic schizophrenics.

Dr. M. R. Lee, Department of Medicine, University of Leeds:

Research assistance and expenses for one year, to undertake a pilot study of salt and water metabolism in manic depressive psychosis.

Dr. R. Rodnight, Institute of Psychiatry, London:

Technical assistance for three years, to investigate the role of dimethyltryptamine in schizophrenia.

Professor G. Russell, Department of Psychiatry, Royal Free Hospital School of Medicine, London:

Research assistance for two years, to study the psychological mechanisms underlying developmental learning difficulties in reading (dyslexia) and in the performance of arithmetic (dyscalculia), and to continue a research project into hallucinations in schizophrenia.

Professor P. H. Venables, Department of Physiology, University of York:

Bridging support for four months, for a long-term study of the incidence of schizophrenia in a limited population.

Professor P. O. Yates, Department of Pathology, The Medical School, University of Manchester:

Research assistance and expenses for three years, to undertake cytophotometric measurement of neuronal changes in relation to ageing and dementia in humans.

Wellcome Senior Research Fellowships in Clinical Science

These fellowship awards were instituted in 1962 to encourage medically-qualified workers of exceptional ability to embark upon careers of clinical research within the United Kingdom. In the past two years this scheme has been extended to

include all medically-qualified graduates working in any university department on a subject directly related to a clinical problem.

Up to the present time 34 of these fellowships have been awarded, six new fellowships having been given in the period under review. In addition, four awards made in the year prior to this report were extended for the full five-year period. These fellowships have proved to be singularly successful in so far as all the former holders have obtained permanent senior appointments mainly in academic departments. These fellowships are highly competitive and are considered annually.

£312,225 was allocated for the support of Wellcome Senior Research Fellowships in Clinical Science during the period under review.

Dr. R. H. T. Edwards, Department of Medicine, Royal Postgraduate Medical School, London:

Extension of his Wellcome Senior Fellowship in clinical science for nine months, for studies in muscle metabolism.

Dr. J. W. Fabre, Nuffield Department of Surgery, Radcliffe Infirmary, Oxford:

Wellcome Senior Fellowship in clinical science for up to five years, for studies of allograft rejection and its specific suppression.

Dr. J. A. Kanis, Nuffield Orthopaedic Centre, University of Oxford:

Wellcome Senior Fellowship in clinical science for up to five years, to investigate renal osteodystrophy and Paget's disease of bone.

Dr. A. J. McMichael, Nuffield Department of Clinical Medicine, University of Oxford:

Wellcome Senior Fellowship in clinical science for one year, to study the genetics and disease associations of the major histocompatibility complex in man.

Dr. J. C. Marshall, Department of Medicine, University of Birmingham:

Continuation of his Wellcome Senior Fellowship in clinical science for up to four further years, to develop methods for the measurement of biologically active hypothalamic releasing hormones in body fluids.

Dr. T. J. Peters, Department of Medicine, Royal Postgraduate Medical School, London:

Extension of his Wellcome Senior Fellowship in clinical science for two years, to investigate the application of sub-cellular fractionation techniques to the study of cell pathology in man.

Dr. J. L. Reid, Department of Clinical Pharmacology, Royal Postgraduate Medical School, London:

Continuation of his Wellcome Senior Fellowship in clinical science for a further four years, to study the central nervous mechanisms in the control of blood pressure and treatment of hypertension.

Dr. P. Snashall, Department of Medicine, Charing Cross Hospital Medical School, London:

Wellcome Senior Fellowship in clinical science for one year, to study problems of solvent and solute exchange in the lung and systemic vascular beds.

Dr. S. Tomlinson, Academic Division of Medicine, University of Sheffield:

Wellcome Senior Fellowship in clinical science for up to five years, to study the mechanism of the action of hormones.

Dr. C. S. Wilcox, Medical Unit, St. Mary's Hospital Medical School, London:

Wellcome Senior Fellowship in clinical science for five years, to study the pharmacology and physiology of renal disorder.

CLINICAL SCIENCES

The awards listed in this section were made in response to applications put before the Trust for the support of specific research projects in clinical science that did not fall within areas designated for special development. £1,042,830 was allocated during 1974-76 for the support of these projects.

Ethical aspects of clinical research

The position of the Trust when dealing with the ethical aspects of applications was reviewed during 1975. After careful consideration of the policy of other organisations, the Trustees resolved that they should follow the practice of the Medical Research Council by insisting on the approval of the ethical committee of the institution concerned but reserving final judgement for themselves even if such an ethical committee had accepted the proposal. They did not consider it possible to formulate general rules, since they considered that it must be possible to conceive a situation where a proposal contains a risk so small and a potential gain so great that the Trustees would have to form their own view. They considered, however, that in addition to examination of the nature of the investigation, they must know exactly who would be carrying it out and who would be responsible for ensuring that the ethical rules are observed.

Anaesthetics

£5,500 was allocated during 1974-76.

RESEARCH FELLOWSHIP

Dr. G. M. Hall, Department of Anaesthetics, Royal Postgraduate Medical School, London:

Fellowship for one year, to study thyroid-catecholamine interactions in Pietrain pigs.

SYMPOSIUM SUPPORT

Obstetric Anaesthetists' Association Symposium on the effects of drugs upon, and their metabolism by, the foetus and neonate, Birmingham, Spring 1977.

Cardiology

Since the British Heart Foundation has substantial funds available for the support of research into Cardiology, the Trustees provide only limited support in this field. Nevertheless, the grants made during the period under review highlight areas of particular interest.

Studies of cardiac metabolism are becoming more important as the advent of new biochemical techniques together with the increased application of open heart surgery enable changes in damaged heart muscle to be investigated. The long-term objective of these studies is to determine ways in which such damage can be limited and, if possible, reversed.

The Trustees have provided support to assist Dr. D. J. Hearse, a biochemist, to link with Mr. M. V. Braimbridge in the Department of Cardiothoracic Surgery at St. Thomas's and undertake a collaborative clinical and biochemical investigation into myocardial protection during open heart surgery. The Trust's staff and some of the Scientific Trustees were given an account of recent work on cardiac metabolism by Dr. Winifred Naylor at one of the noon scientific sessions at the Trust's office.

Not only are new biochemical techniques introducing fresh aspects to cardiac research, but computer systems have also established a new dimension. A grant towards a computer system was made to Dr. A. F. Rickards at the Cardiothoracic Institute. Dr. Rickards was awarded a Wellcome Senior Research Fellowship in Clinical Science in May 1974 and was subsequently appointed in December of that year to the post of Consultant Physician and Director of the Catheter Laboratory at the National Heart Hospital. He is investigating abnormalities of blood flow in the heart and relating them to the area of muscle damage. The results of these investigations are being analysed by computer. Dr. R. A. J. Spurrell at St. Bartholomew's Hospital was awarded a grant for computer equipment to facilitate his studies of the way in which electrical impulses are conducted in the heart.

£66,000 was allocated during 1974-76.

RESEARCH EQUIPMENT

Dr. A. F. Rickards, Cardiothoracic Institute, London:

Contribution towards the cost of a computer system, to investigate the haemodynamic abnormalities associated with myocardial ischaemia.

Dr. R. A. J. Spurrell, Department of Cardiology, St. Bartholomew's Hospital, London:

Equipment to study cardiac activation processes using precordial and epicardial mapping techniques.

RESEARCH FELLOWSHIP

Dr. D. A. S. G. Mary, Cardiovascular Unit, University of Leeds:

Extension of his fellowship for three months, to study atrial receptors: an investigation of types A & B and histology in heart failure.

GRANT FOR RESEARCH EXPENSES AND ASSISTANCE

Dr. D. J. Hearse, Rayne Clinical Research Institute, St. Thomas's Hospital, London:

Research expenses and assistance for three years, for a collaborative clinical and biochemical investigation into myocardial protection during open heart surgery.

SYMPOSIUM SUPPORT

Symposium on cardiac receptors, Leeds, September 1976.

Dentistry

The Trustees are aware of the need for increased research in this field, but the number of applications remains small. An interdisciplinary training fellowship in research was awarded to Mr. D. M. Williams. It is being held jointly at the London Hospital Medical College and at the Royal Postgraduate Medical School. This linked training programme incorporates both diagnostic and experimental pathology and enables Mr. Williams to obtain a training in general pathology as well as joining a research team investigating the control of cell division and of tissue growth and differentiation.

£32,900 was allocated in 1974-76.

SPECIAL FELLOWSHIP

Mr. D. M. Williams, Department of Oral Pathology, The London Hospital Medical College and Dental School:

Fellowship for three years, to complete a study of the leucocyte response following a local inflammatory stimulus and to undertake a period of training in research methods.

GRANT FOR RESEARCH EXPENSES AND ASSISTANCE

Professor A. E. W. Miles, Department of Oral Pathology, The London Hospital Medical College Dental School:

Research and technical assistance for two years, to investigate the oral mucosa and its defence reactions.

Endocrinology

It is now possible to make a brief report on some aspects of the research directed by Professor Iain MacIntyre which has been supported fairly substantially by the Trust during the last five years.

This group at the Royal Postgraduate Medical School has developed methods for peptide synthesis and the preparation of limited sequences of hormones and their conjugates. These preparations have been used to produce antisera specific to the partial sequence. New specific radio-immunoassays have thus become possible, together with immunofluorescence techniques. The localisation of cells specific for the production and storage of cholecystokinin provides an example of the use of these methods.

The development of very small scale methods for sequencing proteins, using radioactive tracers, has enabled the group to make metabolic studies *in vivo* and *in vitro* of peptide hormones, using physiological concentrations. Such studies have been made with the hypothalamic hormone, luteinising hormone releasing hormone (LHRH). This is a relatively simple molecule compared with calcitonin, on which studies will also be made. These scientists have identified the sites of primary cleavage of the LHRH hormone, and using the techniques they have developed they have been able to alter the peptide bond, and then design and synthesise

analogues which are metabolically more stable. The clinical application of these studies is that new compounds may be produced which have a more prolonged therapeutic action.

The group has also synthesised the centrally acting peptides enkephalin and endorphin, and raised antibodies to these substances. In collaboration with Professor Pearse they are carrying out localisation studies with the use of immunofluorescence techniques. Other collaborative projects have been undertaken with Professor J. H. Wolstencroft of Birmingham University to isolate and synthesise centrally acting peptides, probably neurotransmitters, in the central nervous system.

Studies on vitamin D have continued, with the preparation of conjugates of vitamin D and 25-OH vitamin D. Attempts are being made to raise antibodies to vitamin D metabolites, and subsequently characterise more accurately the physiological role of these metabolites. With the use of affinity chromatography, the group has been able to isolate the binding protein of 25-OH vitamin D.

This group is probably unique in the United Kingdom in its activities in the synthesis and sequence chemistry of polypeptide hormones.

£61,500 was allocated during 1974-76.

SPECIAL FELLOWSHIP

Dr. R. H. Greenwood, Department of Medicine, Welsh National School of Medicine, Cardiff:

Fellowship for two years, to investigate methods of improving insulin secretion and carbohydrate tolerance in patients suffering with diabetes.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Professor G. M. Besser, Department of Medicine, St. Bartholomew's Hospital, London:

Research expenses and assistance for three years, to study the application of cytochemical methods to the bioassay of hypothalamic hormones.

Dr. M. J. O. Francis, Nuffield Department of Orthopaedic Surgery, University of Oxford:

Research expenses and assistance for two years, to study the origin, nature and control of production of the somatomedins.

Professor Russell Fraser, Endocrine Unit, Royal Postgraduate Medical School, London:

Extension of grant for a final three months, to study the use of hormone assays in the assessment of treatment of pituitary diseases.

Dr. G. F. Joplin, Department of Medicine, Royal Postgraduate Medical School, London:

Research expenses and assistance for three months, to study urinary free deoxycorticosterone.

Professor J. Landon, St. Bartholomew's Hospital, London:

Bridging support for a research assistant for four months, to develop an improved radio-immunoassay for ACTH.

Dr. P. G. Malan, Institute of Nuclear Medicine, The Middlesex Hospital, London:

Research expenses to investigate the interaction of thyrotrophin with receptor sites in the thyroid gland.

Dr. R. E. Oakey, Division of Steroid Endocrinology, University of Leeds:

Research assistance, expenses and equipment for three years, for an *in vitro* perfusion study to determine whether polypeptide hormones regulate steroid secretion by the human foetal adrenal gland.

SYMPOSIUM SUPPORT

International Endocrinology Conference, Hammersmith Hospital, London, July 1975.

Gastroenterology

The Trustees are receiving an increasing number of applications for support for research in gastroenterology. In the period 1972-74 the allocation was £86,000. The sum allocated for 1974-76 was approximately £220,000. In previous years, the Trustees have provided support for Professor Everson Pearce's research into gastrointestinal hormones, and they have continued to show their interest in this area of research by making a major grant to Dr. S. R. Bloom, for his studies of enteroglucagon and vasoactive intestinal peptides. The importance of studies of biliary excretion and bile salt metabolism have been recognised by personal sup-

port to Dr. R. H. Dowling. The grant from the Trust enabled Guy's Hospital to appoint Dr. Dowling as a whole time Senior Lecturer in the Department of Medicine, for an agreed period, until the Medical School could make a permanent appointment. The title of Professor of Gastroenterology has been conferred on Dr. Dowling since the Trust award was made.

UNIVERSITY AWARD

Dr. R. H. Dowling, Department of Medicine, Guy's Hospital, London:

University award to provide the salary of a senior lecturer over three years, to study bile acid and bile lipid metabolism, and intestinal adaptation.

RESEARCH EQUIPMENT

Professor Barbara Billing, Department of Medicine, Royal Free Hospital, London:

Contribution towards the cost of equipment, to undertake studies involving the radio-immunoassay of bile acids.

Dr. Neil McIntyre, Department of Medicine, Royal Free Hospital, London:

To purchase equipment, to study the nature of plasma lipoprotein changes which occur in liver disease.

RESEARCH TRAINING SCHOLARSHIPS

Two awards were made to junior postgraduate research workers for further research training.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Dr. S. R. Bloom, Department of Medicine, Royal Postgraduate Medical School, London:

Research assistance, expenses and equipment for three years, to study the physiological and clinical importance of enteroglucagon and vasoactive intestinal peptide.

Dr. C. A. R. Boyd, Department of Biochemistry, University of Oxford:

Research expenses for one year, to study the role of the gastrointestinal tract in perinatal nutrition.

Dr. P. B. Cotton, The Middlesex Hospital Medical School, London:

Research, technical, secretarial and nursing assistance, expenses and equipment for three years, to study pure pancreatic secretions obtained from conscious man.

Dr. A. M. Dawson, Department of Gastroenterology, St. Bartholomew's Hospital, London:

Research assistance for three months, to study the absorption of glucose and bicarbonate from the intestine.

Dr. A. P. Douglas, Department of Medicine, Royal Victoria Infirmary, Newcastle upon Tyne:

Technical assistance for three months, to study the aetiology of coeliac disease.

Dr. D. J. Evans, Department of Pathology, Royal Postgraduate Medical School, London:

Extension of support for one year for technical assistance and expenses, to study the isolation and characterisation of a small peptide toxic to patients with coeliac disease.

Dr. R. Holmes, Department of Gastroenterology, Manchester Royal Infirmary:

Research and technical assistance, expenses and equipment for two years, to study the composition of isolated human intestinal microvillous membranes in health and disease.

Professor C. F. McCarthy, Department of Gastroenterology, University of Galway, Eire:

Research assistance, equipment and expenses for three years, to continue a study of small intestinal peptidases, with special reference to coeliac disease.

Dr. G. E. Sladen, Academic Division of Medicine, University of Sheffield:

Research expenses for two years, to study the role of mucosal adenosyl cyclic monophosphate (cyclic AMP) in the regulation of intestinal transport of fluid and ions.

Dr. J. F. Woodley, Biochemistry Research Unit, University of Keele:

Research expenses and equipment for three years, to study the enzymes of the human intestinal epithelial cell membrane, with particular reference to coeliac disease.

Dr. K. G. Wormsley, Ninewells Hospital, Dundee:

Technical assistance and expenses for one year, to study the therapy of exocrine pancreatic insufficiency.

General Medicine

The Library of the Royal Society of Medicine is one of the world's leading collections for research. Increasing costs have meant that the Society has been unable to maintain its binding programme. The Trustees thought it important to make a special grant for this purpose. This brings the Trust's contribution towards the Society's Library to £205,000.

The Society has recently loaned a large part of their nineteenth century material to the Library of the Wellcome

Institute for the History of Medicine. It is hoped that this partnership will be of considerable value to both institutions.

LIBRARY GRANT

Royal Society of Medicine, London:

Five-year grant to cover the expenses of binding books and journals.

Haematology

The Trustees have made several grants for studies of the haemoglobinopathies.

Sickle cell anaemia is an inherited disorder of red blood cells in which the red cells become sickle-shaped when exposed to low oxygen tensions. The abnormally shaped cells are excessively fragile, and consequently there is a haemolytic anaemia. The red cells also tend to aggregate, causing intravascular occlusions. The disease accounts for a considerable mortality throughout the world and is the subject of much research. A grant was made to Dr. Christine Hawkey of the Nuffield Institute of Comparative Medicine, for her studies of the mechanisms causing sickling of mammalian red cells. These have shown the extent to which the sickling phenomenon in some animals is similar to that of human patients, and identified the factors which make for dissimilarities. It is possible that a species will be found which will provide a model for the study of sickle cell disease in man.

The haemoglobinopathy thalassaemia major is a hitherto fatal disease of childhood, occurring in families from the Mediterranean area and the Middle and Far East. The basis of the disease, a disorder of the control of adult haemoglobin synthesis, is of the deepest biological significance. Treatment at present consists of regular blood transfusion, splenectomy when indicated, and the intensive use of desferrioxamine, an iron-chelating agent, to combat the iron overload consequent on the frequent blood transfusions. Interest in the disease at both the clinical and the fundamental level has been growing over the past four or five

years, as it is becoming apparent that increasing numbers of cases are appearing in immigrant families in this country. The prognosis has swung from hopeless to optimistic with advances in management.

Grants have been made to Dr. Bernadette Modell for her research on the antenatal diagnosis of thalassaemia, and the clinical effects and pathology of iron overload. She is also studying the possibility of using a new drug, 2, 3-dihydroxybenzoic acid, which may prevent the absorption of iron which results from the use of desferrioxamine. The grant includes funds for the purchase of pumps for the chronic subcutaneous infusion of desferrioxamine, to enable Dr. Modell to study intensive methods of treatment of thalassaemia.

Patients with β -thalassaemia major and patients with sickle cell anaemia both have increased levels of foetal haemoglobin in their peripheral blood, and there is good evidence that cells which contain foetal haemoglobin do not sickle as readily as those which have low levels of foetal haemoglobin. Normally foetal haemoglobin is evenly distributed throughout the red cell population. It is probable that in sickle cell patients the foetal haemoglobin is limited to relatively few cell lines, so that the majority of the cells are not protected. One solution to the β -thalassaemia and sickle cell problem would be to prevent the normal neonatal switch from foetal to adult haemoglobin production. A major grant to Professor D. J. Weatherall has been made for studies which include examination of the mechanisms of transition of haemoglobin synthesis from the foetal to the adult form.

Professor D. L. Mollin and Dr. Barbara Anderson have studied vitamin B₆ metabolism of red cells in thalassaemia. They have found a reduced red cell conversion of pyridoxine to pyridoxal in a few normal subjects. However such a reduced conversion is present in a majority of individuals carrying the trait for β -thalassaemia. This defect is inherited separately from the haemoglobin defect. There is a possible correlation between the reduced rates of conversion and the severity of the anaemia in patients with homozygous

thalassaemia. The presence of slow pyridoxine conversion in red cells may have clinical implications

The total grant allocation for haematology during 1974–76 was £127,000

RESEARCH FELLOWSHIP

Dr. C. Bunch, Nuffield Department of Clinical Medicine, The Radcliffe Infirmary, Oxford:

Fellowship for two years, to study bone marrow transplantation in man.

RESEARCH TRAINING SCHOLARSHIP

One award was made to a junior postgraduate research worker for further research training.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Professor A. J. Bellingham, Department of Haematology, University of Liverpool: Research expenses and assistance for two years, to study the adaptation of the red cells in hypoxia, and pH disturbances of the newborn.

Dr. C. N. C. Drey, Department of Chemistry and Polymer Technology, Polytechnic of the South Bank, London:

Research assistance for one year, to develop methods for the synthesis of folic acid conjugates.

Dr. Christine Hawkey, Nuffield Institute of Comparative Medicine, The Zoological Society of London:

Research assistance, expenses and equipment for two years, to study factors causing sickling of mammalian red cells.

Professor E. R. Hnehns, Department of Haematology, University College Hospital Medical School, London:

Research expenses and assistance for three years, to study factors regulating iron exchange in liver cells.

Dr. Bernadette Modell, Department of Paediatrics, University College Hospital, London:

Technical assistance, expenses and apparatus for one year, to study puberty in thalassaemia major.

Dr. Bernadette Modell, Department of Paediatrics, University College Hospital, London:

Technical assistance and research expenses as bridging support for one year, to study the antenatal diagnosis of haemoglobinopathies, with particular reference to thalassaemia major.

Professor D. L. Mollin, Department of Haematology, St. Bartholomew's Hospital, London:

Technical assistance and expenses for three years, to undertake a comparison, in β -thalassaemia, of the rate of β -chain synthesis with that of red-cell pyridoxine conversion in the homozygous and heterozygous condition.

Professor D. L. Mollin, Department of Haematology, St. Bartholomew's Hospital, London:

Technical assistance for eighteen months to study serum ferritin concentrations in the elderly, and the relation of these levels to the iron status of this group.

Professor D. L. Mollin, Department of Haematology, St. Bartholomew's Hospital, London:

Research assistance for one year, to study the relationship of the gastric lesion of pernicious anaemia to simple atrophic gastritis.

Professor D. J. Weatherall, Nuffield Department of Clinical Medicine, The Radcliffe Infirmary, Oxford:

Research assistance, expenses and equipment for two years, to study methods of treating some genetic disorders of haemoglobin synthesis.

Metabolic Disorders

The Trustees have continued their support for the study of metabolic disorders in several centres. In the past six years Dr. Roger Smith and his colleagues at the Nuffield Orthopaedic Centre in Oxford have worked on the biological effect of vitamin D metabolites, the biochemical abnormalities of collagen in inherited and acquired disorders of bone, the effects of the phosphonate group of compounds and the biochemical consequences of severe injury.

In 1973 (the year before the period of the present report) Dr. T. C. B. Stamp, with support from the Trustees, established a new radio-immunoassay for circulating levels of 25-hydroxy vitamin D. Since then he has completed a number of other projects and is continuing his studies on mechanisms of vitamin D intoxication, vitamin D deficiency and resistance in anti-convulsant osteomalacia. Dr. Stamp is now a member of a special clinical unit in metabolic bone disease. An interdisciplinary team is engaged in basic research in this field, and bringing the results of the research into clinical use.

The Trustees renewed their support for research at The Nuffield Institute of Comparative Medicine, The Zoological Society of London, on vitamin D metabolism in primates. Dr. A. W. M. Hay has made detailed studies of the transport protein of vitamin D and its metabolites in sixty-three vertebrate species. The survey indicated that only some mammals transport vitamin D₂ and vitamin D₃ series with equal efficiency, and have the potential to utilise both forms of vitamin D.

£88,000 was allocated during 1974–76.

RESEARCH FELLOWSHIP

Dr. D. J. Hosking, Department of Medicine, University of Nottingham:
Fellowship for two years, to study diabetes mellitus and bone disease and mineral metabolism.

VACATION SCHOLARSHIP

One vacation scholarship was awarded.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Dr. Anne Beloff-Chain, Department of Biochemistry, Imperial College of Science and Technology, University of London:
Research assistance and expenses for one year, to study adipose tissue function in genetically obese mice.

Dr. E. Bourke, Department of Medicine, Trinity College, Dublin, Eire:
Research expenses and assistance for two years, to study the pathogenesis of Bartters Syndrome.

Professor Barbara Clayton, Department of Chemical Pathology, Institute of Child Health, London:
Research assistance, expenses and equipment for one year, to study the use of mineral and trace metal mixtures in children.

Professor R. D. Cohen, Department of Metabolic Medicine, The London Hospital Medical College:
Research expenses, to study the mechanism by which diets rich in polyunsaturated fatty acids lower plasma triglyceride levels.

Dr. L. G. Goodwin, Nuffield Institute of Comparative Medicine, The Zoological Society of London:
Research and technical assistance, expenses and equipment for two years, to study vitamin D metabolism in primates.

Dr. Anne Simmonds, Department of Medicine, Guy's Hospital, London:
Research expenses and assistance over two years, for enzyme studies in the metabolism of adenine.

Dr. Roger Smith, Nuffield Orthopaedic Centre, University of Oxford:
Research expenses for two years, to study the long-term effects of vitamin D metabolites in the bone disease of chronic renal failure, and the biochemical effects of severe trauma.

Dr. T. C. B. Stamp, Institute of Orthopaedics, London:
Technical assistance and expenses for three years, to study vitamin D metabolism.

Neurology

Neurology is a subject in which research bridges many disciplines. This is evident in the grants made by the Trustees, which totalled approximately £900,000 during the period under review.

When Professor Burnstock took up his Chair in the Department of Anatomy at University College London, the Trustees provided support for his exciting work on purinergic nerves. Classically the autonomic nervous system consists of two components, cholinergic and adrenergic nerves. During the past ten years evidence has been presented for the existence of a third nerve component in the autonomic system, which is neither adrenergic nor cholinergic. In view of evidence that the transmitter released from these nerves is a purine nucleotide, probably ATP, they have been tentatively called 'purinergic nerves'. The existence of these nerves is now well established throughout the alimentary tract of mammals as well as in that of lower vertebrates. There is evidence to suggest that they may also be present in the lung, the urinary bladder and structures in the eye.

In 1969 Dr. Oliver Holmes was awarded a special Wellcome fellowship to enable him to undertake a period of full-time research in the Department of Anaesthetics at the Royal Postgraduate Medical School. Dr. Holmes has now moved to a post as Senior Lecturer in the Institute of Physiology at the University of Glasgow where, with equipment provided by the Trust, he is continuing his recordings of electrical

activity in the central nervous system. Electroencephalography has also formed the basis of research undertaken by Mrs. A. Scott at the London Hospital, where she has been carrying out studies on the effect of oral tyramine on patients suffering from migraine and epilepsy. Mrs. Scott has shown that the localised disturbance often seen in the resting EEG's of migrainous patients is increased following oral tyramine. This was particularly the case in patients who related some of their attacks to the ingestion of tyramine-containing foods. Significant EEG changes after oral tyramine were also seen in patients who had both migraine and epilepsy, and those with epilepsy alone.

RESEARCH EQUIPMENT

Dr. O. Holmes, Institute of Physiology, University of Glasgow:

To purchase equipment, to continue an analysis of the electrical activity recorded from the brains of monkeys in which experimental epilepsy has been induced.

RESEARCH FELLOWSHIPS

Dr. O. Holmes, Department of Anaesthetics, Royal Postgraduate Medical School, London:

Extension to his special fellowship for six months, to study aspects of the electrical activity of central nervous structures.

Mrs. A. Scott, EEG Department, The London Hospital:

Fellowship, technical assistance and expenses for two years, for an investigation of possible links between migraine and epilepsy using oral amines and EEG measures.

RESEARCH TRAINING SCHOLARSHIP

One award was made to a junior postgraduate worker for further research training.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Dr. H. F. Bradford, Department of Biochemistry, Imperial College of Science and Technology, University of London:

Research expenses and assistance for two years, to investigate the role of neurotransmitters in epilepsy.

Professor G. Burnstock, Department of Anatomy, University College, London:

Research assistance, expenses and equipment for three years, to study the sympathetic innervation of blood vessels in mammals, including humans.

Professor G. Burnstock, Department of Anatomy, University College London:
Research assistance, expenses and equipment for three years, to undertake a multidisciplinary study of purinergic nerves and their possible implication in clinical medicine.

Professor P. M. Daniel, Department of Neuropathology and Biochemistry, Institute of Psychiatry, London:
Research expenses and assistance for three years, to study cerebral protein synthesis.

Dr. A. I. Matus, Department of Biochemistry, Institute of Psychiatry, London:
Research assistance for one year, to investigate the process of synaptic transmission by identifying, isolating and characterising transmitter-binding proteins of the synaptic membranes.

Professor P. K. Thomas, Department of Neurology, Royal Free Hospital, London:
Research expenses for one year, for neurological studies.

SYMPOSIUM SUPPORT

Symposium on basic aspects of neurochemistry related to the epilepsies, Bath, September 1976.

Summer school for post-doctoral research workers in the various aspects of the brain sciences.

Workshop on neurological disorders, University of Nottingham, April 1975.

Summer school on neurones, sensation and behaviour, Cambridge, September 1976.

Obstetrics and Gynaecology

£14,500 was allocated during 1974-76.

RESEARCH FELLOWSHIP

Dr. R. M. L. Winston, Institute of Obstetrics and Gynaecology, Hammersmith Hospital, London:
Fellowship for two years, to study the surgical pathology of the fallopian tube, microsurgical techniques and homograft transplantation.

GRANT FOR TECHNICAL ASSISTANCE

Professor D. V. I. Fairweather, Department of Obstetrics and Gynaecology, University College Hospital Medical School, London:
Extension of technical assistance for seven months, to study plasma progesterone and plasma oestradiol as indices of feto-placental function.

Ophthalmology

Collaborative studies between Professors N. Ashton and Barrie Jones at the Institute of Ophthalmology, and Professor C. T. Dollery at the Royal Postgraduate Medical School, have continued. The Trust has provided support for their investigations into the causes of the destructive and proliferative changes in the retinal vascular bed of patients with diabetes using a combination of clinical, histopathological and biochemical methods.

The clinical research has included participation in a controlled trial of photocoagulation in the treatment of proliferative features of diabetic retinopathy. The difference between treated and untreated eyes was not significant during the first three years after treatment, but thereafter an increasing difference between treated and untreated eyes emerged, in favour of treatment.

Pathological investigations have included examination of basement membrane changes in diabetic retinopathy. Electron microscopy has shown that the pre-capillary arterioles are thickened in the region of the basement membrane and in time this results in occlusion of the lumen. This change may be responsible for the pathological changes of diabetic retinopathy attributable to ischaemia. Biochemical studies are being made with the aim of defining the physiological and biochemical environment within the living retina *in situ*, and then understanding the events leading to capillary damage and new vessel formation.

The Trustees still consider that an important opportunity for research development exists in the association between ophthalmology and general medicine. They are examining ways in which further studies can be promoted.

One new grant was awarded during the period under review.

GRANT FOR RESEARCH EXPENSES AND ASSISTANCE

Dr. D. R. Lucas, Department of Ophthalmology, Manchester Royal Eye Hospital, University of Manchester:

Research expenses and assistance for two years, to study the pathogenesis of sympathetic ophthalmia.

Paediatrics

£12,000 was allocated during 1974–76.

UNIVERSITY AWARD

Dr. R. E. Olver, Department of Paediatrics, University College Hospital, London:
University award to supplement his salary for five years, to study secretion and absorption of lung liquid.

RESEARCH FELLOWSHIP

Dr. C. D. K. Roberts, Institute of Child Health, University of London:
Fellowship for three months, to investigate the activity of plasma lecithin cholesterol acyl transferase in children with hyper-lipoproteinaemia disorders.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Professor L. B. Strang, Department of Paediatrics, University College Hospital, London:

Research assistance for six months for studies in foetal nutrition.

Dr. N. J. Wald, Department of the Regius Professor of Medicine, Radcliffe Infirmary, University of Oxford:

Research and technical assistance and expenses for one year, for a collaborative multi-centre study of alpha-fetoprotein in relation to the antenatal detection of neural tube defects.

Radiology

£16,275 was allocated during 1974–76.

GRANT FOR RESEARCH EXPENSES AND ASSISTANCE

Dr. D. J. Allison, Department of Radiology, Royal Postgraduate Medical School, London:

Research expenses and assistance for three years, to study some aspects of pulmonary vascular control.

Respiratory Disorders

£45,000 was allocated during 1974–76.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Professor L. Finkelstein, Department of Systems Science, The City University, London:

Research assistance for three years, to develop a mathematical modelling system in the investigation of the human respiratory system.

Professor A. Guz, Department of Medicine, Charing Cross Hospital Medical School, London:

Research assistance for one year, to undertake studies to attempt to improve the definition of asthma.

Dr. D. C. S. Hutchison, Chest Unit, King's College Hospital Medical School, London:

Research expenses and assistance for three years, to study the pathogenesis and prognosis in pulmonary emphysema.

Professor Lynne Reid, Cardiothoracic Institute, Brompton, London:

Technical assistance and expenses for three years, to apply structural findings to the interpretation of radiography during life.

Surgery

The Wellcome Trust scheme for Research Fellowships in Surgery began in September 1971, with the purpose of providing time for research training for young surgeons who may wish to take up an academic career. The regulations allow a Fellow to maintain his clinical experience if the investigation is predominantly one using laboratory methods, or animal experimentation. It is, therefore, not difficult for a surgeon to return to the Health Service after holding one of these awards. Twenty-one Fellowships have been awarded in five years and of these seven of the holders have taken up academic appointments, five have returned to the Health Service, and nine are still in post.

The Trustees continued their support for research in the metabolic response to trauma, with an extension of a grant to Professor R. G. Clark of Sheffield University. The theme of the metabolic studies in the Surgical Unit at Sheffield is the relationship between therapy and the metabolic changes which occur after operative trauma. At present detailed studies are being made of the changes in carbohydrate metabolism of patients after operation. The effect which the various carbohydrates available for clinical use have on the response is then investigated. The Trust supports a post-doctoral biochemist for the necessary collaborative work with the surgeons; this is an example of Trust policy to link non-medical biochemists with clinical groups.

The Trustees consider that there is a need to promote research in the pathology of trauma, and are at present studying possible methods of encouraging such studies.

£170,000 was allocated during 1974–76 for the support of surgical research.

WELLCOME RESEARCH FELLOWSHIPS IN SURGERY

Mr. J. Clark, Department of Surgery, University of Liverpool:

Fellowship for up to two years, to study the anti-reflux mechanism in oesophageal reconstructions with segments of bowel.

Mr. J. P. S. Cochrane, Department of Surgery, Middlesex Hospital Medical School, London:

Fellowship for one year, to study the stimuli causing aldosterone secretion at the time of surgery.

Dr. A. R. Crapp, General Hospital, Birmingham:

Fellowship for two years, to study the surgery of bile gastritis.

Mr. J. Ferguson, Department of Surgery, Royal Victoria Infirmary, University of Newcastle upon Tyne:

Fellowship for one month, to study the preservation and transplantation of micro-dissected islets of Langerhans in the guinea pig.

Dr. D. R. A. Finch, Nuffield Department of Surgery, University of Oxford:

Fellowship for one year, to study the suppression of rejection of pancreatic islet cell allografts.

Dr. D. G. Hardy, Department of Neurosurgery, The London Hospital:

Extension of his Fellowship for three months, to study the role of intravascular changes in the initiation of cerebral infarction.

Dr. I. D. Harrison, Department of Surgery, University of Liverpool:

Fellowship for two years, for a clinical and experimental study of portal systemic shunts in the treatment of portal hypertension.

Mr. M. H. Jourdan, Department of Surgery, Guy's Hospital Medical School, London:

Fellowship for one year, to study the effects of post-operative nutritional regimes on sulphur metabolism in human subjects.

Mr. N. K. Maybury, Department of Surgical Studies, Middlesex Hospital, London:

Fellowship for two years, for studies of different types of surgical vagotomy.

Mr. R. J. Salem, Department of Cardiac Surgery, Royal Postgraduate Medical School, London:
Fellowship for one year, to study the protection of the myocardium during cardiac surgery.

Mr. K. Shute, Department of Surgery, St. Thomas's Hospital Medical School, London:
Fellowship for one year, to study the treatment of acute massive intestinal ischaemia with intraluminal oxygen.

Mr. A. R. Taylor, Department of Surgery, Royal Postgraduate Medical School, London:
Fellowship for one year, to study the metabolism and neutralisation of heparin using radioisotopes.

Mr. D. G. T. Thomas, University Department of Neurosurgery, Institute of Neurological Sciences, University of Glasgow:
Fellowship for up to two years, for immunological studies in relation to brain tumour and head injury.

Dr. R. T. Watson, Department of Surgery, Royal Victoria Infirmary, University of Newcastle upon Tyne:
Fellowship for three years for a clinical and immunological study of homograft tympanic membranes and ossicles in middle ear reconstruction.

RESEARCH EQUIPMENT

Dr. R. C. G. Russell, Surgical Unit, St. Mary's Hospital, London:
Equipment to study the radio-immunoassay of gastrointestinal hormones.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Dr. J. H. Baron, Department of Surgery, Royal Postgraduate Medical School, London:
To purchase chemicals, to study the effect of GH-RIH on gastric secretion in the dog.

Professor R. G. Clark, Surgical Unit, University of Sheffield:
Research expenses and assistance for up to three years, to continue his investigation of metabolic changes in surgical patients.

Professor H. A. F. Dudley, Department of Surgery, St. Mary's Hospital, London:
Research expenses and assistance for two years, to undertake studies in surgical endocrinology and sleep.

Professor L. E. Hughes, Department of Surgery, Welsh National School of Medicine, Cardiff:
Research and technical assistance and expenses for one year, to undertake an integrated pharmacological, histological and clinical study of diverticular disease of the sigmoid colon.

Dr. P. W. R. Petrie, Princess Margaret Orthopaedic Hospital, Edinburgh:
Research expenses to develop an elastic tendon prosthesis.

GRANT IN AID OF PUBLICATION

Dr. J. H. Baron, Department of Surgery, Royal Postgraduate Medical School, London:

Contribution towards the cost of colour illustration in a paper entitled "The use of neutral red as a pre-operative test of vagal innervation".

Vascular Disorders

The total allocation of support in this category during the period under review amounted to over £105,000 and considerably exceeds that provided in the previous two years. This was due largely to a major grant made to Professor G. H. du Boulay who is studying cerebral vessel reactivity and spasm. Professor du Boulay has developed a model for studying angiographically the state of the cerebral arteries of anaesthetised baboons. He is particularly interested in investigating the effects of pharmacological agents on the cerebral arterial spasm which occurs after subarachnoid haemorrhage.

Since the ratio of geriatric beds in the hospital population is increasing and the chief cause of mortality in youth is trauma, with head injury predominating, the need for more research into brain function and the cerebral circulation requires no emphasis. The Trustees have selected this as one of the special topics which they wish to promote.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Dr. L. J. Beilin, Department of Medicine, University of Oxford:

Research expenses and assistance for four months, to study the control of the renal circulation.

Professor G. H. du Boulay, Nuffield Institute of Comparative Medicine, The Zoological Society of London:

Research and technical assistance, expenses and equipment for three years, to study cerebral arterial reactivity.

Dr. M. Harper, Wellcome Surgical Research Institute, University of Glasgow:

Research assistance, expenses and travel for three months, to study amine mechanisms in the blood-brain barrier.

Professor F. W. Robertson, Department of Genetics, University of Aberdeen:

Research and technical assistance, expenses and equipment for three years, to study the genetics of variation in the kinetics of HMG CoA reductase activity in relation to hyperlipidaemia and coronary heart disease.

BASIC SCIENCES

The Trustees recognise the importance of continuing their support for research in the basic sciences. During the period under review they allocated £1,666,568 for the basic sciences, compared to £781,550 in 1972–74. The proportion of the total allocation has risen from 18 per cent to 30 per cent in 1974–76. The Trustees' policy has been to receive applications over a wide range of scientific fields, and to judge them on their scientific merits.

In the special area of Pathology (histopathology, microbiology, haematology, chemical pathology, and immunology) the Trustees are now starting a scheme for the provision of fellowships, each tenable for a period of up to three years, to encourage research in these subjects by medically-qualified graduates.

The Trustees have also decided to establish a new scheme of Senior Research Fellowships in Basic Biomedical Sciences. These will provide opportunities for research for particularly promising scientists at a time when University posts are scarce. The subjects of study will be any basic science problem relevant to medicine, and Fellows may have qualifications in either medicine or basic science.

Anatomy

£21,000 was allocated during 1974–76.

RESEARCH EQUIPMENT

Dr. Margaret Bird, Department of Anatomy and Histology, The London Hospital Medical College:

Grant towards the cost of equipment, to study the development and ultra-structure of central nervous system cells *in vitro*.

Professor G. J. Romanes, Department of Anatomy, University of Edinburgh:

Grant towards the cost of equipment, to continue studies, by members of the Anatomy Department, on human articular cartilage, motor nerve fibres of the rat, and cellular mechanisms in human autoimmune disease.

VACATION SCHOLARSHIPS

Two vacation scholarships were awarded.

GRANT FOR RESEARCH ASSISTANCE

Professor E. G. Gray, Department of Anatomy and Embryology, University College London:

Research assistance for one month, to study the mechanisms of synaptic transmission.

SYMPOSIUM SUPPORT

Symposium on the biology of cephalopods, in honour of Professor J. Z. Young, London, April 1975.

Biochemistry

Grants in the field of Biochemistry continue to form a major part of the Trust's awards for research in the basic sciences. The Trustees give preference to the support of biochemical work related to human disease. Thus a collaborative study on neuromelanin between the School of Chemistry and the Department of Dermatology in Newcastle received support.

A grant was made to Dr. G. B. West and Dr. E. Khedouri at the North East London Polytechnic to enable them to test orally active amino acid derivatives as anti-inflammatory agents. They hope that the long-term application of this work will eventually be of value in cases of rheumatoid arthritis and osteoarthritis.

The role of cell membranes in health and disease is attracting increasing interest and support was provided for Dr. A. D. Smith at the Courtauld Institute of Biochemistry for studies of the role of membrane lipids in antigenic stimulation.

The Trustees first supported Dr. A. Cuschieri in his work on the kallikrein-kinin system when he was a Senior Lecturer in Surgery in Liverpool. When he was appointed to the Chair of Surgery in Dundee early this year, the Trustees noted

that a strong group of research workers interested in pancreatic disease already existed there. This made a special opportunity to provide support for studies of pancreatic disease.

The Trustees are often sympathetic to new holders of Chairs who are seeking to establish their own programmes. Thus part of a grant made to Professor Peter Campbell as Director of the Courtauld Institute of Biochemistry was to enable him to retain the help of a skilled research assistant from Leeds.

£377,000 was allocated for the support of biochemical research during 1974–76.

Biochemistry (General)

RESEARCH EQUIPMENT

Dr. Margery Ord, Department of Biochemistry, University of Oxford:
Grant to purchase equipment, to study the control of growth in normal cells.

RESEARCH TRAINING SCHOLARSHIPS

Two awards were made to junior postgraduate research workers for further research training.

VACATION SCHOLARSHIPS

Six vacation scholarships were awarded.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Dr. G. B. Ansell, Department of Pharmacology, University of Birmingham:
Research assistance and expenses for eighteen months, to study the binding of morphine to sub-cellular components of the brain *in vivo* and its effect on their metabolism.

Dr. E. Bailey, Department of Biochemistry, University of Sheffield:
Research expenses for two years to study ketone body formation during development of the rat.

Dr. A. Brading, Department of Pharmacology, University of Oxford:
Research assistance and expenses for three months, to investigate the trans-membrane Ca/Na exchange in *Taenia coli* in the guinea-pig.

Professor J. B. Chappell, Department of Biochemistry, University of Bristol:
Research assistance for six weeks, to study the transport of glutamine and glutamate across the inner mitochondrial membrane.

Professor K. S. Dodgson, Department of Biochemistry, University College, Cardiff:
Research expenses for three years, to study sulphate esters of biological importance.

Dr. T. L. Dormandy, Department of Chemical Pathology, Whittington Hospital, London:
Research assistance for one year, to study lipid autoxidation and biological anti-oxidant mechanisms.

Dr. C. T. G. Flear, Department of Clinical Biochemistry, University of Newcastle upon Tyne:
Research assistance and expenses for six months, to study the clinical importance of disturbances in the exchange of water and solutes across cell membranes.

Professor J. N. Hawthorne, Department of Biochemistry, Medical School, University of Nottingham:
Research assistance for three months to study surugatoxin.

Professor F. A. Jenner, Department of Psychiatry, University of Sheffield:
Bridging support for a research assistant, to investigate abnormal electrolyte metabolism in affective psychoses.

Professor D. Lewis, Department of Applied Biochemistry and Nutrition, University of Nottingham:
Research expenses for eighteen months, to investigate uric acid synthesis.

Professor I. Mills, Department of Investigative Medicine, University of Cambridge:
Research assistance and expenses for two years, to study the metabolism of non-esterified fatty acids in relation to the mechanism of ketogenesis.

Dr. Helen Muir, Division of Biochemistry, The Mathilda and Terence Kennedy Institute of Rheumatology, London:
Bridging support for three months, to study the inter-relationship of proteoglycan and collagen biosynthesis in cartilage with the use of selective inhibitors.

Dr. R. Niedegerke, Department of Biophysics, University College London:
Research assistance, expenses and equipment for three years, to study the time course of action of the digitalis glycosides (and related compounds) and of the catecholamines in cardiac muscle cells.

Sir Rudolph Peters, Department of Biochemistry, University of Cambridge:
Technical assistance and expenses for one year, to study fluoroacetate synthesis in brain tissue.

Dr. R. G. Price, Department of Biochemistry, Queen Elizabeth College, University of London:
Research expenses for three years, to study the structure and metabolism of normal and pathological renal glomerular basement membrane.

Professor Brenda Ryman, Department of Biochemistry, Charing Cross Hospital Medical School, London:

Research assistance and expenses for two years, to study mammalian glycogen metabolism.

Professor G. A. Swan, Department of Organic Chemistry, University of Newcastle upon Tyne:

Research assistance, expenses and equipment for two years, to study the isolation, structure and function of neuromelanin and its role in disease and drug metabolism.

Dr. M. Tanner, Department of Biochemistry, University of Bristol:

Research assistance, expenses and equipment for three years, to study the structure and function of the proteins of the erythrocyte membrane.

SYMPOSIUM SUPPORT

Symposium in honour of Sir Ernst Chain's 70th anniversary, London, June 1976.

Contribution towards the travel funds of the Biochemical Society for the 10th International Congress of Biochemistry in Hamburg in July 1976 and for the annual meetings of the Federation of European Biochemical Societies over the next three years.

Symposium on porphyrins, London, February 1975.

Symposium on the use of nuclear magnetic resonance in organised biological systems and living tissues, Oxford, April 1976.

Carbohydrate Biochemistry

GRANT FOR RESEARCH EXPENSES AND ASSISTANCE

Professor W. Bartley, Department of Biochemistry, University of Sheffield:

Research assistance and expenses for one year and eight months, to study the regulation of carbohydrate metabolism in the liver by the metabolites of isolated liver cells.

Enzyme Biochemistry

UNIVERSITY AWARD

Dr. Patricia McLean, Department of Biochemistry, Middlesex Hospital Medical School, London:

Salaries and expenses for a final two years, to study the control of the pentose phosphate pathway of glucose metabolism.

RESEARCH EQUIPMENT

Dr. R. Perham, Department of Biochemistry, University of Cambridge:
Contribution towards the cost of equipment to study glycolytic enzymes and multi-enzyme complexes.

Professor P. J. Randle, Department of Biochemistry, University of Oxford:
Grant to purchase equipment, for studies in enzyme biochemistry.

RESEARCH TRAINING SCHOLARSHIPS

Four awards were made to junior postgraduate research workers for further research training.

VACATION SCHOLARSHIPS

Two vacation scholarships were awarded.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Dr. H. G. Britton, Department of Physiology, St. Mary's Hospital Medical School, London:

Research assistance for six months, to study the mechanism of pyruvate kinase from rabbit muscle.

Dr. A. Cnschieri, Department of Surgery, University of Liverpool:

Research assistance and expenses for six months, to investigate the isolation and purification of intestinal kallikrein.

Professor A. Cuschieri, Department of Surgery, University of Dundee:

Research assistance and expenses for three years, for a human and experimental study of the release of proteolytic enzymes and their inhibition in acute pancreatitis.

Mr. J. Hernion-Taylor, Department of Experimental Surgery, The London Hospital:

Research assistance and expenses for nine months, to study the isolation, immunology and clinical applications of the enzyme enterokinase.

Dr. J. D. McGivan, Department of Biochemistry, University of Bristol:

Research assistance and expenses for six months, to study urea synthesis.

Dr. W. R. D. Smith, Courtauld Institute of Biochemistry, Middlesex Hospital Medical School, London:

Bridging support for a research assistant for five months, to investigate glutamic acid decarboxylase activity in the central nervous system in the normal and B₆-deficient developing rat.

GRANT IN AID OF PUBLICATION

Dr. F. P. Altman, The Institute of Orthopaedics, Royal National Orthopaedic Hospital, Stanmore:

Contribution towards the publishing costs of a monograph on tetrazolium salts and formazans.

Hormone Biochemistry

RESEARCH EQUIPMENT

Dr. A. G. Green, District Laboratory, County Hospital, York:

Grant to purchase equipment for his research into the development of cytochemical hormone assay techniques.

RESEARCH TRAINING SCHOLARSHIP

One award was made to a junior postgraduate research worker for further research training.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Dr. K. D. Bhoola, Department of Pharmacology, University of Bristol:

Research expenses for a collaborative study of secretion in endocrine glands.

Dr. P. Cohen, Department of Biochemistry, Medical Sciences Institute, University of Dundee:

Bridging support for six months, to study post-receptor events in the hormonal regulation of glycogen metabolism by adrenaline and insulin.

Dr. A. G. Green, District Laboratory, County Hospital, York:

Technical assistance, expenses and equipment for three years, to investigate the development and application of ultra-sensitive cytochemical hormone assays for plasma gastrin, adreno-corticotrophic hormone and thyroid stimulating hormone.

Dr. Catherine Hebb, A.R.C. Institute of Animal Physiology, Cambridge:

Research expenses for ten months, to study the metabolism of acetylcholine.

Dr. M. C. Richardson, Department of Chemistry, Liverpool Polytechnic:

Research assistance, expenses and equipment for two years, to study the steroidogenic action of ACTH on adrenocortical cells.

Sir Frank Young, New Addenbrooke's Hospital, Cambridge:

Research assistance, expenses and equipment for two years, to investigate the mechanism whereby growth hormone diminishes the uptake of glucose by adipose and muscle tissue.

Lipid Biochemistry

RESEARCH EQUIPMENT

Dr. K. Snell, Department of Biochemistry, University of Surrey:

Equipment to study the effects of overfeeding during suckling on the development of lipid and carbohydrate metabolism in the rat.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Professor R. Barer, Department of Human Biology and Anatomy, University of Sheffield:

Bridging grant for research assistance for three months, to study the involvement of lipids in abnormal mammalian development.

Dr. G. G. Lunt, School of Biological Sciences, University of Bath:

Research assistance and expenses for one year, to study unesterified fatty acids in cerebral cortex and their role in convulsive disorders.

Dr. A. D. Smith, Courtauld Institute of Biochemistry, Middlesex Hospital Medical School, London:

Research and technical assistance for three years, to study the mechanism by which fatty acids inhibit the transformation of lymphocytes to blast cells.

Protein Biochemistry

CAPITAL GRANT FOR BUILDING

Professor H. L. Kornberg, Department of Biochemistry, University of Cambridge:
Contribution towards the cost of rebuilding a laboratory, to establish a laboratory for research into membrane proteins.

RESEARCH TRAINING SCHOLARSHIPS

Three awards were made to junior postgraduate research workers for further research training.

VACATION SCHOLARSHIP

One vacation scholarship was awarded.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Professor P. N. Campbell, Courtauld Institute of Biochemistry, Middlesex Hospital Medical School, London:

Research assistance, expenses and equipment for two years, to study the biosynthesis of milk proteins in the guinea-pig mammary gland.

Professor J. R. Clamp, Department of Medicine, University of Bristol:
Research assistance and expenses for three years, for structural studies of IgM glycopeptides.

Dr. J. Herbert, Department of Anatomy, University of Cambridge:
Expenses during a visit to Sweden, to study changes in cerebral monoamines induced by drugs or hormones.

Dr. R. H. Hinton, Wolfson Bioanalytical Centre, University of Surrey:
Research assistance and expenses for ten months, to study the movement of glycoproteins from hepatocyte plasma membrane to serum.

Dr. G. B. West, Department of Applied Biology, North East London Polytechnic:
Research assistance, expenses, travel and equipment for two years, to undertake a biochemical and pharmacological investigation into the role of amino acids as anti-inflammatory agents.

Bioengineering

RESEARCH TRAINING SCHOLARSHIPS

Three awards were made to junior postgraduate research workers for further research training.

Biology

The Trustees made a grant of £25,000 to the Zoological Society of London in response to a special request from Lord Zuckerman, who pointed out that inflation had had a very serious effect on the two research institutes at the London Zoo. This grant was made to give the Zoological Society the opportunity to re-organise its finances. The building for the Wellcome Institute of Comparative Physiology had been provided by the Wellcome Trustees in 1961.

GRANTS FOR RESEARCH EXPENSES

Dr. T. Norman, Department of Zoology, University of Cambridge:
Research expenses for two years, to study the mechanism of neuro-secretion in the blowfly.

Lord Zuckerman, The Zoological Society of London:
Contribution towards the support of the Research Institutes at the London Zoo.

SYMPOSIUM SUPPORT

Symposium on the meiotic process, Cambridge, December 1975.

Biophysics

Biophysics and bioengineering are subjects in which interdisciplinary studies are increasing. The Trustees do not normally support projects concerned with refinements of technique and improvement of equipment. Their emphasis is on supporting fundamental studies that may have some application to medicine. Support for such studies was given to Professor D. N. S. Kerr of the Department of Medicine, and Professor L. Maunder of the Department of Mechanical Engineering, Newcastle upon Tyne, for studies in haemodialysis, including investigations into the physiological effects of fast dialysis, particularly with regard to larger molecules.

£42,000 was allocated during 1974–76.

CAPITAL GRANT FOR BUILDING

Dr. A. J. Creeth, Department of Medicine and Biochemistry, Medical School, University of Bristol:

Building and equipment costs, to study the characterisation of blood group specific glycoproteins by density gradient methods.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Professor D. N. S. Kerr, Department of Medicine, University of Newcastle upon Tyne:

Research assistance and expenses for three years, for fundamental studies in haemodialysis.

Professor C. A. Pasternak, Department of Biochemistry, St. George's Hospital Medical School, London:

Research assistance and expenses for one year, to study the precursors of plasma membrane components.

Professor J. A. Simpson, Department of Neurology, University of Glasgow:

Research assistance for two years, to investigate the application of new electrophysiological techniques to the study of neuromuscular disease.

SYMPOSIUM SUPPORT

Conference on the formation, perception and measurement of medical images, Leeds, April 1976.

Fourth conference of the International Organisation of Medical Physics, Ottawa, August 1976.

Genetics

VACATION SCHOLARSHIPS

Three vacation scholarships were awarded.

Immunology

Over the past seven years the Trust has made major grants to the Department of Medicine, King's College Hospital, for studies carried out by Dr. Roger Williams and his colleagues on auto-immune liver disease.

Immunological reactions are thought to be of importance in the pathogenesis of two types of chronic liver disease, namely active chronic hepatitis and primary biliary cirrhosis. Dr. Williams and his group have made a detailed analysis of cellular immune response to liver antigens, in active chronic hepatitis. They have also examined the possibility that in primary biliary cirrhosis there is an auto-immune reaction directed at bile duct epithelium.

Grants totalling £100,000 were allocated for research in immunology during the period under review.

UNIVERSITY AWARD

Dr. A. Eddleston, Department of Medicine, King's College Hospital, London:
Continuation of a University Award for a final two years, to undertake studies in auto-immune liver diseases.

RESEARCH TRAINING SCHOLARSHIPS

Two awards were made to junior postgraduate research workers for further research training.

VACATION SCHOLARSHIPS

Two vacation scholarships were awarded.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Professor J. R. Batchelor, Queen Victoria Hospital, East Grinstead:
Research assistance for two years, to study immunological enhancement and its clinical application in the suppression of graft rejection.

Professor R. Y. Calne, Department of Surgery, University of Cambridge:
Technical assistance and expenses for three years, to study macrophage function in animals with allografts treated with immuno-suppressive agents.

Dr. J. R. Corvalan, Department of Immunology, A.R.C. Institute of Animal Physiology, Cambridge:

Research expenses for one year, to study T lymphocyte differentiation.

Dr. A. J. Fairfax, St. George's Hospital Medical School, London:

Research expenses for one year, to study the immunopathogenesis of heart block.

Professor P. H. Gell, Department of Experimental Pathology, University of Birmingham:

Research assistance and expenses for one year, to investigate the functional status of peripheral blood lymphocytes from severely burned patients.

Dr. D. K. Peters, Department of Medicine, Royal Postgraduate Medical School, London:

Research assistance for one year, to study the isolation and immunochemical characterisation of the C3 nephritic factor.

Dr. R. S. H. Pumphrey, Department of Bacteriology, The Royal Infirmary, Glasgow:

Research expenses for two years, to make a comparative study of the plasma cells of the mammary gland during pregnancy, lactation and involution.

Professor Margaret Turner-Warwick, Institute of Diseases of the Chest, University of London:

Research assistance and expenses for one year, to study immunological profiles in organic dust diseases of the lungs.

Dr. Roger Williams, Liver Unit, Department of Medicine, King's College Hospital, London:

Research assistance and expenses for two years, to study auto-immune liver disease, with particular reference to cell mediated immune response.

SYMPOSIUM SUPPORT

A workshop and conference on genetic determinants and mechanisms of immune reactions in mice.

Symposium on the Immunology of Infectious Diseases, Rosario, Argentina, November 1975.

Symposium on Immunopathology, Germany, 1976.

Symposium on the functional sub-divisions of the thymus-dependent lymphoid cell population, Bellagio, Italy, 1975.

Microbiology

Applications for grants for research in microbiology have been increasing in number. £40,000 was awarded in 1972-74, and £186,000 in the subsequent two years.

The Trustees have been particularly interested in projects concerned with mycology, for which they have provided grants totalling approximately £75,000. The section of this report concerned with Wellcome Trust policy for veterinary medicine also refers to the Trustees' recognition of the need for studies in mycology related to veterinary medicine.

During the period of the present report, Dr. W. I. Marshall of the Hospital for Sick Children completed the tenure of a University Award made by the Trust to enable him to work with Professor J. A. Dudgeon, on the pathogenesis of intra-uterine infection. Approximately 10 per cent of congenital abnormalities are due to environmental factors, of which virus infections are an important group. The damage to the foetus from maternal rubella and cytomegalovirus can be severe; but an infectious cause of disease, once identified, is potentially preventable. Professor Dudgeon and Dr. Marshall have shown that the wide range of disorders produced by rubella virus cannot be attributed to any single pathological process. They consider that it is unlikely that foetal virus infections play a significant role in the causation of spontaneous abortion. The frequent chromosomal defects found in spontaneous abortion are not likely to be induced by any of the common virus infections. Their work fails to confirm the presence of a specific mitotic inhibitor factor produced by rubella virus. They are continuing their studies on the pathogenesis of the major foetal defects resulting from maternal rubella infection, which are heart malformations, cataracts and ear disorders. They have shown that some manifestations of congenital rubella occur after organogenesis is complete; fortunately, these are usually transient and resolve within a few months.

There are some important differences between congenital rubella and cytomegalovirus (CMV) infections. The latter shows a higher incidence of subclinical infection at birth,

but there is a greater likelihood of serious damage occurring in later life. Dr. Marshall is carrying out an extensive study to determine the role of CMV as a cause of deafness, and a wide variety of neurological disorders.

The Trustees have supported work on other virus diseases, and a major grant was made to Professor A. J. Zuckerman of the London School of Hygiene and Tropical Medicine for his studies of viral hepatitis type B. This disease has emerged as a serious health problem throughout the world. Epidemiological studies have shown that the belief is no longer tenable that this disease is spread exclusively by blood and blood products through the parenteral route. There is a clear need for developing a suitable vaccine for active immunisation against hepatitis type B and Professor Zuckerman's studies are directed to this end.

UNIVERSITY AWARD

Dr. W. C. Marshall, Department of Microbiology, Hospital for Sick Children, London:

Six months' extension of his University Award, to continue his studies in the pathogenesis of intra-uterine infections.

RESEARCH EQUIPMENT

Professor K. R. Dumbell, Department of Virology, St. Mary's Hospital Medical School, London:

Grant to purchase additional equipment, to study the nutritional requirements of virus-infected cells.

RESEARCH FELLOWSHIP

Mr. P. K. Austwick, Nuffield Institute of Comparative Medicine, The Zoological Society of London:

Personal support for nine months, to study fungal toxins.

Dr. P. F. Lehman, Department of Experimental Pathology, University of Birmingham; Department of Immunology, University of Cambridge:

A special fellowship and fares for three years, to study acquired immunity to *Aspergillus fumigatus*.

RESEARCH TRAINING SCHOLARSHIPS

Three awards were made to junior postgraduate research workers for further research training.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Professor H. R. Carne, Department of Pathology, University of Cambridge:
Research assistance and expenses for three years, to investigate the purification, chemical nature, and biological properties of the exotoxin of *Corynebacterium ovis*.

Mr. E. G. Evans, Department of Mycology, The General Infirmary, Leeds:
Research assistance and expenses for three years, to improve methods for the diagnosis of systemic forms of candidiasis and aspergillosis.

Dr. M. H. Hill, Public Health Laboratory Service, London:
Research assistance and expenses for three years, to study the bacteria and the etiology of ulcerative colitis.

Professor N. A. Mitchison, Department of Zoology, University College London:
Research assistance for two years, to study immunity to herpes simplex virus.

Dr. A. Pearson, Department of Microbiology, University of Southampton:
Research expenses, to complete a research programme on tularaemia.

Dr. G. R. B. Skinner, Department of Virology, University of Birmingham:
Technical assistance and expenses for two years, to study a type-specific antigen of type 2 herpes simplex virus.

Professor H. Smith, Department of Microbiology, University of Birmingham:
Research and technical assistance and expenses for three years, to study the chemical diagnosis of human aspergillosis and phycomycosis.

Professor J. T. Smith, Department of Pharmaceutics, School of Pharmacy, University of London:
Research assistance and expenses for one year, to study transmissible penicillin resistance in gram negative bacteria.

Dr. J. L. Stanford, School of Pathology, The Middlesex Hospital Medical School, London:
Research assistance, expenses and equipment for three years, to undertake a collaborative investigation of *Mycobacterium avium*.

Dr. J. Stephen, Department of Microbiology, University of Birmingham:
Research assistance and expenses for three years, to study biochemical determinants of *Vaccinia* virus cytotoxicity *in vitro* and *in vivo*.

Professor A. J. Zuckerman, London School of Hygiene and Tropical Medicine:
Research and technical assistance, expenses and equipment for three years, to study sub-unit hepatitis B vaccines.

SYMPOSIUM SUPPORT

A meeting on the problems of listeriosis, Nottingham, September 1974.

GRANT IN AID OF PUBLICATION

Dr. J. M. T. Hamilton-Miller, Department of Medical Microbiology, Royal Free Hospital School of Medicine, London:

Colour illustrations in a paper on *Pseudomonas aeruginosa*.

Molecular Biology

£28,000 was allocated during 1974-76.

RESEARCH TRAINING SCHOLARSHIPS

Three awards were made to junior postgraduate research workers for further research training.

VACATION SCHOLARSHIP

One vacation scholarship was awarded.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Professor A. S. V. Bnrngen, National Institute for Medical Research, Mill Hill, London:

Expenses for Dr. M. A. Resnick, to study cellular DNA metabolic and repair enzyme systems.

Professor C. F. Phelps, Department of Biological Sciences, University of Lancaster: Research assistance for one year, to study the molecular mechanism of cation-promoted conformation in the sulphated glycosaminoglycans.

Dr. M. G. Rumsby, Department of Biology, University of York:

Research assistance and expenses for two years, to study the surface molecular architecture of central and peripheral nerve myelin.

Pathology

In the general comments on basic sciences in this report, reference has been made to the Trustees' wish to encourage research in pathology.

At a meeting organised by the Royal College of Pathologists, it was stated that in 1972 NHS hospital laboratories received about 40 million requests for diagnostic tests, at a cost of

£34 million. This statement is repeated now because it shows that the training of pathologists must inevitably be directed towards enabling them to provide the necessary services for the NHS. The result must be that the pathologist has less time available for research. At the same time, because of the increasing service demands, there is a growing tendency for the "mechanisation" of pathology. The introduction of automated diagnostic methods is ideal for NHS needs, but it also probably follows that laboratory work will eventually become less attractive for men wishing to pursue their own ideas with work at the bench. It is hoped that the Trustees' scheme for fellowships in pathology will provide time to enable young pathologists to pursue their research interests.

Over the past three years, with the assistance of grants from the Trust, Dr. T. J. Peters at the Royal Postgraduate Medical School has established a research group which applies a new approach to human and experimental pathology. The basis of this approach is the application of analytical subcellular fractionation techniques to milligram quantities of tissue, obtained by biopsy procedures from a variety of organs. Technically this has become possible because of the development of small volume zonal ultra-centrifuge rotors. Dr. Peters has made studies of the role of lysosomes in myocardial infarction, and the subcellular localisation of creatine phosphokinase in the heart. He has also studied the subcellular pathology of coeliac disease and a variety of liver diseases.

£70,000 was allocated for the support of research in Pathology during 1974-76.

RESEARCH TRAINING SCHOLARSHIPS

One award was made to a junior postgraduate research worker for further research training.

VACATION SCHOLARSHIPS

Two vacation scholarships were awarded.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Professor G. V. R. Born, Department of Pharmacology, University of Cambridge:
Contribution towards expenses of chemicals and animals, for studies in platelet aggregation.

Professor D. B. Brewer, Department of Pathology, University of Birmingham:
Research and technical assistance, expenses and apparatus for three years, to study glomerular morphometry and permeability after injection of various proteins.

Dr. J. A. N. Corsellis, Rnnwell Hospital, Wickford:
Research expenses for one year, to study certain aspects of the effects of age on the human brain.

Dr. Y. B. Gordon, Department of Reproductive Physiology, St. Bartholomew's Hospital Medical College, London:
Research assistance for three years, to develop a specific assay for fibrin-derived fragment D dimer.

Dr. Kristin Henry, Department of Pathology, Westminster Medical School, London:
Technical assistance for two and a half months, for a light and ultrastructural study of the human thymus in myasthenia gravis.

Professor D. M. Matthews, Department of Experimental Chemical Pathology, Westminster Hospital, London:
Research expenses for three years, to study vitamin B₁₂ metabolism and individual cobalamins.

Professor L. Michaels, Institute of Laryngology and Otolaryngology, London:
Research assistance and expenses for three years, to study the ultra-structure of the stria vascularis and the effect of diuretics on it.

Dr. T. J. Peters, Department of Medicine, Royal Postgraduate Medical School, London:
Technical assistance and expenses for three years, to investigate the application of subcellular fractionation techniques to the study of cell pathology in man.

Pharmacology

The Trustees have retained an active interest in this field since they first instigated the Wellcome Research Training Fellowships in Clinical Pharmacology in 1966. Since that time several new Departments of Clinical Pharmacology have been created and the Trustees were particularly pleased when one of the holders of a Wellcome Senior Research

Fellowship in Clinical Science, Dr. A. M. Breckenridge, took the Chair of Pharmacology and Therapeutics in the University of Liverpool at the end of 1974.

In 1975 Dr. M. C. L'E. Orme, a previous holder of a Wellcome-Swedish Fellowship, was given a University Award to enable him to take up a Senior Lectureship in Professor Breckenridge's department. Both Professor Breckenridge and Dr. Orme had previously worked in Professor Dollery's department at the Royal Postgraduate Medical School. Professor Dollery has continued his studies of the mechanisms of drug toxicity and the Trustees provided him with a grant for gas chromatography equipment for this purpose.

Professor Eleanor Zaimis has been collaborating with Professor C. Bartorelli and Professor A. Zanchetti of Milan in research into the action of hypotensive drugs. The Trustees helped her to obtain the equipment necessary to continue these studies in London as part of their scheme to promote inter-laboratory research in Europe.

The development of drug resistance presents an increasingly frequent difficulty in medical practice. The Trustees have provided support for a collaborative investigation into the problem. Professor W. V. Shaw in the Department of Biochemistry in Leicester is working together with Dr. Eric Cundliffe in the Department of Pharmacology in Cambridge on bacterial resistance to antibiotics. They are looking in depth at the way in which this develops with chloramphenicol.

£105,000 was allocated during 1974-76.

UNIVERSITY AWARD

Dr. M. C. L'E. Orme, Department of Pharmacology and Therapeutics, University of Liverpool:

University Award for two and a half years, to undertake studies of drug action.

RESEARCH EQUIPMENT

Professor C. T. Dollery, Department of Pharmacology, Royal Postgraduate Medical School, London:

Equipment and research expenses for three years, to study the mechanisms of drug toxicity.

Dr. R. W. Ryall, Department of Pharmacology, University of Cambridge:
Grant to purchase equipment, to study the central actions of analgesics.

Professor Eleanor Zaimis, Department of Pharmacology, Royal Free Hospital School of Medicine, London:
Grant to purchase equipment, to investigate the peripheral and central action of drugs.

RESEARCH TRAINING SCHOLARSHIPS

One award was made to a junior postgraduate research worker for further research training.

VACATION SCHOLARSHIPS

Four vacation scholarships were awarded.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Dr. M. S. Arenson, Department of Pharmacology, St. Bartholomew's Hospital Medical College, London:
Research expenses for one year, to study "receptor reserve" in relation to neuromuscular transmission.

Dr. K. D. Bhoola, Department of Pharmacology, University of Bristol:
Research assistance and expenses for two years, to study the functional role of salivary serine proteinases (kallikrein) in health and disease.

Dr. J. C. Dearden, School of Pharmacology, Liverpool Polytechnic:
Research expenses and equipment for one year, for an investigation into aspirin derivatives.

Professor J. R. Hodges, Department of Pharmacology, Royal Free Hospital School of Medicine, London:
Research assistance for a further six months, to investigate the role of corticosteroids in the regulation of corticotrophin secretion.

Dr. Priscilla Piper, Department of Pharmacology, Royal College of Surgeons, London:
Research assistance and expenses for one year, to study prostaglandin metabolism in the lungs.

Professor J. P. Quilliam, Department of Pharmacology, St. Bartholomew's Hospital Medical College, London:
Research assistance for four weeks, to study the factors regulating the release of acetylcholine from the spinal cord.

Professor W. V. Shaw, Department of Biochemistry, University of Leicester:
Research assistance and expenses for three years, to investigate antibiotic action, with particular reference to chloramphenicol.

Dr. H. S. A. Sherratt, Department of Pharmacology, The Medical School, University of Newcastle upon Tyne:

Research assistance and expenses for nine months, to study drug acylation in liver.

Professor J. B. Stenlake, Department of Pharmaceutical Chemistry, University of Strathclyde, Glasgow:

Research assistance for one year, to study the application of high pressure liquid chromatography in drug metabolism and pharmacokinetics.

Professor J. B. Stenlake, Department of Pharmaceutical Chemistry, University of Strathclyde, Glasgow:

Research assistance and expenses for four months, to continue his studies on the human metabolism of the thiocarbamide antithyroid drugs.

Dr. K. I. Williams, Department of Pharmacology, University of Bath:

Research assistance, expenses and equipment over three years, to study substances affecting the synthesis and breakdown of prostaglandins in the uterus.

Dr. L. J. F. Youlten, Department of Pharmacology, Royal College of Surgeons, London:

Research assistance and expenses for one year, to continue a study of the pharmacological aspects of leucocyte behaviour.

SYMPOSIUM SUPPORT

Symposium on drug interactions, London, March 1975.

Sixth International Congress of Pharmacology, Helsinki, July 1975.

Physiology and Reproductive Physiology

The allocation of funds for studies in physiology forms the largest single item in the budget for both the basic and clinical sciences. The allocation has increased from £163,214 (29 grants) in 1972–74 to £475,539 (38 grants) in 1974–76. This increase is partly due to rising costs, but mainly results from the Trustees' policy of encouraging inter-departmental collaboration, particularly between clinical and basic science departments. Other grants for such work are listed under "Interdisciplinary Projects" in the present report, and their costs amount to approximately £150,000.

Grants for research in physiology include a major award to Professor K. W. Cross of the London Hospital Medical College, for his studies on heat production in the infant

brain. Professor Cross has estimated that in the adult brain, heat production is 18 per cent of total metabolism, whereas in the infant it is 70 per cent of the whole. His studies will provide valuable information relating to the thermo-response of the newborn infant.

A grant was made for a collaborative project between Professor P. Kent of Durham University, and Professor J. Widdicombe of St. George's Hospital Medical School. They are making a fundamental study of respiratory obstruction, in physiological and biochemical terms. The investigators have devised new methods for measuring the output and composition of tracheal mucus glycoproteins resulting from nervous and pharmacological stimulations. The two laboratories will combine their facilities for electron microscopy, histology and autoradiography, cell culture and physiochemical techniques.

One of the few grants for major items of equipment was made to Professor P. F. Baker, of King's College, London. The Trustees considered that Professor Baker's interests in membrane transport processes fitted well with those of a number of other members of his department, and provided the basis for the development of an important research programme.

The allocation of £117,380 to studies in reproductive physiology includes major support for Dr. P. W. Nathanielsz of the Physiological Laboratory in Cambridge, where he is working with chronically catheterised foetal sheep preparations. Experimental work of this kind on animals is yielding information of value in human obstetrics.

Physiology

UNIVERSITY CHAIR

The Royal Society, London:

A capital grant to the Society, to increase the endowment for the Henry Dale Research Professorship.

RESEARCH EQUIPMENT

Professor F. Alexander, Department of Veterinary Pharmacology, Royal (Dick) School of Veterinary Studies, Edinburgh:

Equipment and research expenses for three years, to study the neurophysiology of the brain stem of the lamprey.

Professor P. F. Baker, Department of Physiology, King's College, University of London:

Grant to purchase equipment, to study membrane physiology and cellular neurophysiology.

Professor E. J. Denton, Marine Biological Association, Plymouth:

Grant to purchase equipment, to study the properties of excitable cell membranes.

Dr. R. G. Edwards, Physiological Laboratory, University of Cambridge:

Contribution towards the cost of equipment, for studies on the immunological relationship between mother and foetus.

Professor R. D. Keynes, Physiological Laboratory, University of Cambridge:

Grant to purchase animals and equipment, to study secretagogue control and ultrastructural changes in the gastric mucosa of newborn piglets.

Professor E. E. Rojas, School of Biological Sciences, University of East Anglia:

Grant for equipment and research expenses over three years, to study electrical activity of pancreatic B cells in normal and diabetic rodents.

Professor D. E. M. Taylor, Department of Applied Physiology, Royal College of Surgeons, London:

Grant to purchase equipment, for computer-aided studies in fluid dynamics of heart valves and in patient monitoring.

RESEARCH TRAINING SCHOLARSHIPS

Eight awards were made to junior postgraduate research workers for further research training.

VACATION SCHOLARSHIPS

Ten vacation scholarships were awarded.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Dr. M. W. B. Bradbury, Department of Physiology, King's College, University of London:

Technical assistance for three months, to undertake an analysis of transport in relation to structure in guinea-pig placenta.

Dr. F. W. Campbell, Physiological Laboratory, University of Cambridge:

Research assistance for one year, to study human eye movements.

Dr. S. P. Canfield, Department of Physiology, St. Mary's Hospital, London :
Research assistance for two years, for a quantitative investigation of the mechanism of action of drugs on acid secretion of the mammalian stomach *in vitro*.

Dr. R. M. Case, Department of Physiology, University of Newcastle upon Tyne :
Research expenses and equipment for three years, to study stimulus-secretion coupling in the pancreatic acinar cell.

Professor R. Creese, Department of Physiology, St. Mary's Hospital Medical School, London :
Research assistance for one year, to study the action of drugs and transmitter agents on skeletal muscle.

Professor K. W. Cross, Department of Physiology, The London Hospital Medical College :
Research assistance and equipment over three years, to study infant brain heat production.

Dr. R. G. Edwards, The Physiological Laboratory, University of Cambridge :
Technical assistance and expenses for one year, to study protein synthesis and secretion by the rat endometrium.

Dr. J. M. Forrester, Department of Physiology, University of Edinburgh :
Research expenses for eight months, to study the effect of antibiotics on intestinal protein absorption, in the Department of Biochemistry, University of Oxford.

Dr. Roger Hainsworth, Cardiovascular Unit, Department of Physiology, University of Leeds :
Research expenses for two years, to investigate reflex inotropic responses of the heart resulting from lung inflation.

Professor S. M. Hilton, Department of Physiology, University of Birmingham :
Research assistance and expenses for one year, for a retrograde neuro-anatomical study of central nervous pathways involved in control of the circulation.

Dr. Olga Hndlicka, Department of Physiology, University of Birmingham :
Research and technical assistance and expenses for three years, to study the formation of new capillaries in skeletal muscle.

Dr. John Kay, Department of Biochemistry, University of Sussex :
Research and technical assistance and expenses for up to three years, to study the role of changes in cell membrane function in the growth control mechanisms of lymphocytes.

Professor W. R. Keatinge, Department of Physiology, The London Hospital Medical College :
Research assistance for six months, to investigate drug sensitivity of the action potential of striated muscle before and after denervation.

Professor W. R. Keatinge, Department of Physiology, The London Hospital Medical College:

Research assistance, expenses and equipment for three years, to study the transmission and ionic mechanism of electrical activity in arterial smooth muscle.

Professor P. Kent, Glycoprotein Research Unit, Science Laboratories, University of Durham:

Research assistance, equipment and expenses for three years, to study neuropharmacological reactions in the control of secretion with reference to the respiratory tract.

Dr. V. L. Lew, Physiological Laboratory, University of Cambridge:

Technical assistance, expenses and apparatus for three years, to study the transport of calcium and its role in the control of the cation permeability of biological membranes.

Professor R. J. Linden, Cardiovascular Unit, Department of Physiology, University of Leeds:

Research assistance for three years, to study diuresis from stimulation of atrial receptors in the dog.

Professor R. J. Linden, Cardiovascular Unit, Department of Physiology, University of Leeds:

Research expenses for three years, to study the function of atrial receptors.

Professor D. B. Moffat, Department of Anatomy, University College, Cardiff:

Research and technical assistance, expenses and equipment for three years, to study the transport of substances into and out of the renal medulla, with particular reference to chemotherapeutic agents.

Dr. M. J. Purves, Department of Physiology, University of Bristol:

Research assistance for three months, to study central chemosensitivity in the cat.

Dr. M. J. Purves, Department of Physiology, University of Bristol:

Bridging support for a research assistant for three months, to study the regulation of respiration.

Dr. M. B. Segal, Sherrington School of Physiology, St. Thomas' Hospital, London:

Research expenses for three years, to study the role of the choroid plexus in brain sugar and amino acid homeostasis.

Dr. A. M. Sillito, Department of Physiology, University of Birmingham:

Research assistance, expenses and equipment for three years, to study the functional organisation of the corticofugal input to the lateral geniculate body.

Dr. R. M. Simmons, Department of Physiology, University College London:

Costs of interlaboratory collaboration, to study the mechanical properties of skeletal muscle fibres, with the Department of Biology, University of York.

Dr. J. D. W. Slater, Institute of Clinical Research, The Middlesex Hospital Medical School, London:

Expenses for an expedition to the Peruvian Andes, to study the control of aldosterone secretion in man at high altitude.

Dr. R. S. Snart, Department of Zoology, University of Sheffield:

Research assistance and expenses for one year, to study hormones and membrane permeability.

Dr. R. W. S. Tomlinson, Department of Medicine, King's College Hospital Medical School, London:

Extension of a research assistance grant for six months, to study the mode of action of catecholamines on isolated amphibian epithelial membranes.

Professor C. A. Vernon, Department of Chemistry, University College London:

Research assistance and expenses for three years, to study nerve growth factor and its anti-serum.

Professor H. E. de Wardener, Department of Medicine, Charing Cross Hospital Medical School, London:

Research assistance and equipment for two years, to study the identification and characterisation of natriuretic substances in the urine of man.

Professor D. R. Wilkie, Department of Physiology, University College London:

Research assistance and equipment for six months, to study living and contracting muscle, by ^{31}P nuclear magnetic resonance.

Professor J. Z. Young, Department of Anatomy, University College London:

Research and technical assistance and expenses for three years, to continue his studies on neuro-anatomy and physiology, and the history of studies of the nervous system, at The Wellcome Institute for the History of Medicine, London.

SYMPOSIUM SUPPORT

International symposium on the synapse, St. Andrew's University, Spring 1976.

The Second International Conference on the Neurohypophysis, Florida, November 1976.

A meeting on visual mechanisms, Norwich, April 1975.

Symposium on intercellular junctions and synapses in development, Cambridge, April 1976.

Supplementary grant towards the cost of a symposium to celebrate the centenary of the birth of Sir Henry Dale on aspects of synaptic transmission, Cambridge, September 1975.

GRANTS IN AID OF PUBLICATION

Dr. J. Bligh, A.R.C. Institute of Animal Physiology, Cambridge:
Contribution towards the costs of publishing the proceedings of symposia on environmental and thermal physiology, held in 1974.

Dr. R. S. Comline, Physiological Laboratory, University of Cambridge:
Grant for repairs to Sir Joseph Barcroft's films on foetal physiology.

Reproductive Physiology

CAPITAL GRANT FOR BUILDING

Professor G. S. Dawes, Nuffield Institute for Medical Research, University of Oxford:

Grant to build a sheep accommodation unit, for various projects using pregnant sheep.

RESEARCH EQUIPMENT

Professor D. Lacy, Department of Zoology and Comparative Anatomy, St. Bartholomew's Hospital Medical College, London:

Grant to purchase equipment, to continue his study of testicular dysfunction and related abnormalities in man.

RESEARCH TRAINING SCHOLARSHIP

One award was made to a junior postgraduate research worker for further research training.

VACATION SCHOLARSHIP

One vacation scholarship was awarded.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Professor F. Beck, Department of Anatomy, University of Leicester:
Research assistance and expenses for seven months, to study certain aspects of embryology.

Dr. R. D. H. Boyd, Department of Paediatrics, University College Hospital, London:

Technical assistance and expenses for three years, to study transplacental potential and electrolyte permeability.

Professor D. Lacy, Department of Zoology and Comparative Anatomy, St. Bartholomew's Hospital Medical College, London:

Technical assistance for one year, to study testicular dysfunction and related abnormalities in man.

Dr. R. D. Martin, Wellcome Institute of Comparative Physiology, The Zoological Society of London:

Research assistance for one year, to study the reproductive biology of the Aotus monkey.

Dr. P. W. Nathanielsz, Physiological Laboratory, University of Cambridge:

Research assistance, expenses and equipment over three years, to study the role of the neurohypophysis in the foetus.

Dr. P. W. Nathanielsz, Physiological Laboratory, University of Cambridge:

Technical assistance and expenses for three years, to study the foetal hypothalamopituitary system.

Dr. Catherine A. J. Wilson, The Royal Veterinary College, London:

Technical assistance and expenses for three years, to study the control of the onset of the cyclic surge of gonadotrophin at puberty.

B. SUPPORT OF MEDICAL RESEARCH OVERSEAS

Tropical Medicine

It has been obvious for some years that in spite of advances in knowledge of tropical diseases and other conditions occurring in the developing world, the health status of the people in these areas has not improved to a comparable degree to those living elsewhere. This is a matter for international concern.

In the Trust's report covering the years 1972-74, reference was made to the meeting organised by the Trust with the Rockefeller Foundation in Bellagio in Italy. This was a meeting of senior scientists of the developed world with long-standing involvement in tropical research. One of the most significant conclusions of this meeting was summarised as follows: "The application of the accumulated knowledge and research expertise which exists in the Schools and Institutes of developed countries is necessary to create the most rapid improvement possible in the health of the people in tropical areas".

During the last two years, the World Health Organization has appropriately taken the lead in co-ordinating a programme whereby sophisticated medical research can be directed at conditions arising in tropical areas. The W.H.O. Special Programme for Research and Training in Tropical Diseases has focused attention on six diseases: filariasis, leishmaniasis, leprosy, malaria, schistosomiasis, and trypanosomiasis. In general, the strategy of the Organisation is to determine research priorities through Task Forces which have been established to consider each disease, and to identify and support a network of laboratories primarily in Africa to implement the Task Forces' proposals. A multi-disciplinary research centre may in due course be established to co-ordinate and to strengthen individual laboratories in the network. This development, initiated by W.H.O., has been the most significant event in tropical medicine research for many years. The Wellcome Trust has been concerned with this planning: Dr. P. O. Williams, Director of the Trust, has been Chairman of the Planning Group of the

Special Programme, and in 1974 the Trustees allocated £25,000 to W.H.O. as a contribution towards the cost of the planning stages.

Since the Trust's role in the support of tropical medicine research is essentially a supporting and complementary one, its own policies to some extent wait upon such international decisions. The Trust has had close relationships with W.H.O., particularly with regard to its established units for the study of schistosomiasis, leishmaniasis and gastroenterological disorders in Kenya, Brazil and India respectively. On several occasions in the past, the Trust has also provided support for scientific meetings sponsored by W.H.O. and the Pan-American Health Organization.

The Trustees have recognised that the numbers working in tropical medicine research have dwindled during recent years in both the developing and the developed world. However, in consequence of the introduction of the W.H.O. Special Programme there will be new opportunities for scientists of high calibre to pursue long-term research in this field. The Trustees are, therefore, giving consideration to the introduction of special tropical fellowships to be awarded over the next three or four years. These will be designed to give scientists, who have already demonstrated their potential, opportunities to develop their skills with the possibility of eventually becoming available to the W.H.O. Special Programme.

The Wellcome Research Unit, Vellore, India

This unit at the Christian Medical College of Vellore in Southern India, has been supported by the Trust since 1957. Professor Selwyn Baker, who first went to Vellore in 1955, has led the research team during the whole of this time and more recently has been supported by Professor A. N. Radhakrishnan, Professor of Biochemistry, and Professor V. I. Mathan, Professor of Gastroenterology. Professor Baker retired at the end of July 1976. The contributions that he and his colleagues have made to our knowledge of the aetiology of sprue, the mechanisms of absorption and associated haematological disorders, have had an inter-

national impact. Professor Baker's influence on the development of research at the Christian Medical College, Vellore, has been immense. As a teacher and a counsellor, he has played a significant part in the development of the medical school as an internationally recognised centre of excellence. Since 1967, Professor Baker has held a staff position as Professor of Medicine with the World Health Organization supported by the Trust. This association between W.H.O. and the Trust has enabled Professor Baker's advice and knowledge to be available to a much wider professional audience than would otherwise have been the case.

Professor Baker's departure heralds a new era of development in research in Vellore. The Council of the Christian Medical College which has always regarded the development of research as an essential part of its function as a teaching institution, has now been able to set aside funds for the direct support of full-time research. In addition, the Trust is continuing to provide support for the work which will now be undertaken jointly by Professor Radhakrishnan and Professor Mathan. Continuing studies concern the mechanisms of protein loss in sprue and other causes of malabsorption. Investigations of peptide transport will be intensified. A major objective of the work, the elucidation of the aetiology of sprue, will concentrate on determining the importance of a recently isolated virus-like particle. This will involve further epidemiological and clinical studies and electronmicroscopy.

The Wellcome Parasitology Unit, Belem, Brazil

Dr. R. Lainson, the Director of the Unit, and his colleagues Dr. J. J. Shaw and Dr. R. D. Ward, have continued their studies on cutaneous and mucocutaneous leishmaniasis. The objective of the research remains focused on the possibility of producing an immunising agent capable of protecting against the more severe manifestations of leishmania infection. The increasing employment of large labour forces in the endemic regions of Brazil emphasises the significance of the work being undertaken.

Studies have continued on cross-immunity trials with different leishmanias in monkeys. The results obtained have

been valuable in confirming the taxonomic separation of the *mexicana* and *braziliensis* complexes of leishmania. It has also been established that parasites of the *mexicana* group are unlikely to produce an antigen which would immunise against *Leishmania braziliensis braziliensis*, which appears to be the major parasite concerned in the mucocutaneous form of leishmaniasis, espundia. It has also been shown in monkeys that *Leishmania braziliensis guyanensis* produces satellite nodules and closely follows the pattern of most human infections with this parasite (pian-bois).

Studies on sandflies have further helped to distinguish leishmania species and sub-species. The intensive effort to improve culture techniques of leishmania has resulted in an encouraging improvement in the growth of a number of isolates of *Leishmania braziliensis braziliensis*, which formerly have been resistant to growth in culture. This new development will facilitate antigen production and improve the prospects of possible vaccine production.

The culture of sandflies has been successfully maintained. It has proved possible to infect sandflies artificially with a number of leishmania species in both the amastigote and promastigote stages. These studies tend to confirm the taxonomic divisions that have already been made.

The field epidemiological studies of animals and vectors have continued in Amapa and in Sierra dos Carajas.

The Unit is established as part of the parasitological division of the Evandro Chagas Institute of the Brazilian Ministry of Health in Belem. The work being undertaken by the Unit is essentially collaborative and depends to a great degree on the co-operation and collaboration which has been received from the Director Dra. Gilberta Bensabath and her colleagues. The field work is only made possible through the active co-operation of commercial and governmental organisations working in the areas surrounding the Amazon Basin.

Wellcome Trust Research Laboratories, Nairobi, Kenya

At the beginning of 1974 the Trust established a long-term project at the Wellcome Trust Research Laboratories,

Nairobi, for fundamental studies on the immunology of schistosomiasis. The project is under the honorary directorship of Professor V. Houba, who is also Director of the W.H.O. Research and Training Centre in Immunology and Visiting Professor of Immunology at Nairobi University.

The research programme has three main elements. The first, depending on parasitology and epidemiology, is largely the concern of Dr. R. F. Sturrock. A breeding colony of snails has been maintained since early 1974 which has provided sufficient cercariae from infected snails for the establishment of experimental infection and for use in cytotoxicity tests. The cercariae thus produced are used to infect both mice and baboons. The colony of baboons has been enlarged to over 100 animals to facilitate long-term experiments. The first baboon experiment was set up in July 1974 and completed in February 1975. The purpose of this experiment was to determine the parasitological parameters of *Schistosoma mansoni* infection of baboons and simultaneously to provide material for the development of immunological techniques. This was followed by a baboon challenge experiment which was started in March 1975. Eighty baboons received a primary cercarial exposure at different dose levels; at varying times since primary exposure they have been challenged with specific doses of cercariae. Whilst there was no evidence of immunity eight weeks after the initial challenge, evidence of immune reaction increased at 16 weeks and the experiment will be continued at 32 and 64 weeks after challenge.

Dr. A. E. Butterworth has been primarily responsible for studies on cellular immunity, some dependent upon the baboon experiments. New method of assaying antibody-dependent cell-mediated damage to target schistosomulae have resulted in a detailed analysis of the cytotoxic reaction. Study of the role of the eosinophil in damaging the schistosomulum has become a major part of the programme. It may well be that these studies will cast some light on the biological function of this previously enigmatic cell.

Professor Houba's interests are mainly immunopathological. His work has concentrated on the demonstration of antigens and antibodies in immune complexes in the circulation of

infected baboons. In addition microscopic and direct immunofluorescent studies have been made on all kidneys and livers from sacrificed baboons. An evaluation of this study will be made when the experiment is completed in late 1976.

The programme of research at the Laboratories has attracted collaboration with local scientists in Kenya and a number of established groups from Europe and America. The Unit continues to benefit from the interest and co-operation received from Dr. J. Itotia, the Director of Public Health Laboratories, and his colleagues, particularly Dr. Siangok, Director of the Division of Vector-borne Diseases.

The Wellcome-London-Harvard Scheme

This scheme, introduced by the Trust in 1970, recognised the need for recruitment of young scientists to tropical medicine research. Recruitment is still very necessary in 1976 when academic medicine is still only slowly developing in tropical countries, and when population and disease prevalence are increasing.

Dr. K. Mott and Dr. R. Hoff, both of Harvard, continued their work on Chagas' disease in the Bahia province of Brazil and the project is now well established in Castro Alves due to the productive co-operation of members of the Medical School of the Federal University of Bahia, members of the Health Department of the State of Bahia, and the Federal Government.

Factors relating to the transmission and clinical effects of the disease have been intensively studied. These include the epidemiology and household distribution of serological reactivity to *Trypanosoma cruzi*, electrocardiographic classifications for studies of Chagas' disease, a search for more sensitive procedures for isolation of *T. cruzi* from patients, an investigation of central nervous system involvement in patients with acute Chagas' disease, and studies on congenital transmission. The Harvard group has been associated with the group under Dr. Donald Minter, including Dr. E. Minter-Goedbloed, Dr. M. A. Miles, and Mr. T. Barrett, all from the London School of Hygiene and Tropical

Medicine. This group has been especially concerned with basic entomological and parasitological studies focused on the small town of São Felipe, near Salvador. The main part of the study came to an end in August 1975, and the results from the group's multidisciplinary studies have helped build up a more complete picture of the ecology of *T. cruzi* transmission among bugs, men and animals living in and near infested houses. Extensive publications have resulted from the work of both groups.

Dr. J. S. Lehman, a member of the Harvard group, completed his studies on schistosomiasis and left the Scheme in July 1975. His work was concerned with the association of *S. mansoni* infection with protein in an endemic area, and with the intensity and effects of infection with *S. mansoni* in a rural community. Dr. Lehman has now joined the McConnell Clark Foundation where he is responsible for their schistosomiasis programme. Dr. R. Morrow, who was associated with the Harvard group from the introduction of the Scheme in 1970, and played a major part in the planning stages of the projects, left Harvard in March 1976 for an appointment in Ghana.

Dr. A. Fenwick of the London School of Hygiene and Tropical Medicine has continued his work in the Sudan on schistosomiasis. This has primarily been concerned with studies on molluscicidal techniques in the Gezira irrigation scheme, studies on the biology of snails, and clinical studies in collaboration with colleagues in the Sudan.

The latest appointment to the Scheme is Dr. M. Golden, of the London School of Hygiene and Tropical Medicine, who is studying protein turnover in malnourished children. He is attached to the Tropical Metabolism Research Unit at the University of the West Indies.

Whilst not formal members of the Scheme, other scientists linked with home bases in the United Kingdom have been supported by the Trust. Dr. J. Patrick of St. Thomas's Hospital has continued his work in the Tropical Metabolism Research Unit in Jamaica, and has made important contri-

butions to the understanding of leucocyte sodium transport, and zinc and cadmium status in hypertension in Jamaica as compared with this condition in the United Kingdom. Dr. P. S. Friedmann, who is attached to the Department of Pathology at the Royal College of Surgeons spent one year at the Armauer Hansen Research Institute in Addis Ababa, where he was able to make an intensive study of the cellular immune status in syphilis. Dr. D. Warrell completed his attachment to the Department of Medicine at the Ahmadu Bello University, Zaria, Nigeria, in November 1974. He had made progress with regard to the study of coma in cerebrospinal meningitis and significant contributions to the pathology and clinical understanding of snake bite due to *Echis carinatus*. Dr. Warrell has since been appointed Consultant Physician at the Radcliffe Infirmary, Oxford.

The West Indies

Apart from the support already mentioned given to scientists working at the Tropical Metabolism Research Unit of the University of the West Indies, the Trust has also continued to support the development of immunological research in the Department of Medicine. This is concerned with studies of systemic lupus erythematosus and complement deficiency in sickle cell disease. Dr. G. R. V. Hughes of the Royal Post-graduate Medical School returned from the West Indies in July 1975; he has helped to create a link between Hammett and Jamaica which it is hoped will be of continuing advantage to both Schools.

General

The Trust's allocation for tropical medical research during 1974-76 was £1,386,651, which represents an increase of over half a million pounds compared to the previous two years.

As will be seen from the list of grants which follows, the Trust has continued to give a limited number of research training scholarships and fellowships. Fellowships have been limited to those applicants who are already engaged in research activities in established research posts in their own countries to which they intend to return. The Trust con-



Sir John McMichael and Dr. P. O. Williams visiting the site of the new Wellcome factory at São Paulo, Brazil, in 1975

tinues to give support to scientists of exceptional merit whose work is difficult to categorise. Mr. Jonathan Kingdon, who with the Trust's support compiled an atlas of East African mammals, was given further support to continue his work on facial signal patterns in primates.

The Trust has continued to support students visiting the Medical Research Council's Laboratories in The Gambia, and has given contributions to several student expeditions to the Tropics which have included a specific element of medical research.

In order to foster communication between centres of tropical medicine research in Europe the Trust has been prepared to provide funds for this purpose. One meeting was held at the Trust involving scientists from Basle, the Liverpool School of Tropical Medicine, and the Imperial College Field Station at Silwood Park. This meeting concerned the comparative behaviour of malarial parasites, trypanosomes and leishmania in their insect hosts. It is hoped that this meeting will give rise to the development of collaborative working programmes.

Visits

Visits have been maintained to overseas centres where the Trust is supporting scientists. Sir John McMichael and Dr. Williams visited Brazil and Dr. Hopwood has visited India and Africa. Dr. Williams and Dr. Hopwood were invited to attend the inauguration of the Naficy building of the Institute of Public Health in Tehran and had the opportunity of visiting research centres in Iran. Close contact has also been maintained with the World Health Organization in Geneva in relation to the development of the Special Programme.

WELLCOME RESEARCH UNITS

India: Wellcome Research Unit, Christian Medical College, Vellore.

Brazil: Wellcome Parasitology Unit, Belem.

Kenya: Wellcome Trust Research Laboratories, Nairobi.

WELLCOME-LONDON-HARVARD SCHEME

Professor D. S. Bertram, Department of Entomology, London School of Hygiene and Tropical Medicine:

Personal support and research expenses for Dr. E. Minter-Goedbloed, to complete and write up studies on Chagas' disease carried out in Brazil.

Professor W. H. R. Luinsden, Department of Medical Protozoology, London School of Hygiene and Tropical Medicine:

Personal support and research expenses for Dr. M. A. Miles under the Wellcome-London-Harvard scheme, for one further year, to study *Trypanosoma cruzi* infection.

Professor G. S. Nelson, Department of Medical Helminthology, London School of Hygiene and Tropical Medicine:

Extension of personal support and running expenses for one year and ten months for Dr. A. Fenwick under the Wellcome-London-Harvard scheme, to continue his studies of schistosomiasis in the Sudan.

Professor J. C. Waterlow, Department of Human Nutrition, London School of Hygiene and Tropical Medicine:

Personal support and research expenses for four years for Dr. M. H. N. Golden under the Wellcome-London-Harvard scheme, to study protein turnover in children in Jamaica.

Professor T. Weller, School of Public Health, Harvard University, Boston, U.S.A.:

Support of Wellcome-London-Harvard Fellows for three years, to work in Salvador on Chagas' and other tropical diseases.

GRANTS FOR RESEARCH FELLOWSHIPS AND PERSONAL SUPPORT

Dr. A. Arregni, University of Lima, Peru: M. R. C. Neurochemical Pharmacology Unit, University of Cambridge:

Fellowship for two years, to study brain peptides.

Professor S. J. Baker, Christian Medical College, Vellore, India:

Special fellowship and travel expenses for one year, to review gastroenterological work relating to sprue and Southern Indian enteropathy.

Professor G. H. Beale, Institute of Animal Genetics, University of Edinburgh: Institute of Health Research, Chulalongkorn University, Bangkok, Thailand:

Grant to supplement a Royal Society Overseas Visiting Professorship, to advise on research and training.

Mr. A. Belehu, Royal College of Surgeons, London: Armauer Hansen Research Institute, Addis Ababa, Ethiopia:

Fellowship for one year, to study the relationship between humoral and cell-mediated immune responses to *Mycobacterium leprae* in humans and experimental animals.

Dr. G. H. Creasey, M. R. C. Clinical and Population Cytogenetics Unit, Edinburgh: International Agency for Research on Cancer, Nairobi, Kenya:

Fellowship for one year, to develop the lymphocyte bank and to study the *in vitro* measurement of cell-mediated immunity in East African subjects with a variety of disease backgrounds.

Dr. D. Franks, Department of Pathology, University of Cambridge: Wellcome Trnst Research Laboratories, Nairobi, Kenya:

Special fellowship for six months, to study cellular immunological reactions to parasites.

Dr. H. S. Fraser, Department of Medicine, University of the West Indies, Jamaica: Department of Clinical Pharmacology, Royal Postgraduate Medical School, London:

Extension of his fellowship for nine months, to complete studies on the influence of hepatic disease, environment and race upon the rate of metabolism of drugs in the liver.

Dr. P. S. Friedmann, Department of Pathology, King's College Hospital, London: Department of Pathology, Royal College of Snrgeons of England and Department of Dermatology, University of Newcastle-upon-Tyne:

Extension of his fellowship for one year, to study cell-mediated immune responses in human syphilis.

Professor J. F. Goodwin, Department of Clinical Cardiology, Royal Postgraduate Medical School, London, and Professor Eldryd Parry, Department of Medicine, Ahmadu Bello University, Zaria, Nigeria:

Personal support for Dr. John Sanderson for two years and three months over a four-year period, to investigate peripartum heart failure by non-invasive techniques.

Dr. S. K. Jain, Vallabhbhai Patel Chest Institute, India: Department of Medicine, Charing Cross Hospital, London:

Supplement for living expenses in the United Kingdom, to study respiratory reflexes using local aerosol anaesthesia.

Mr. J. Kingdon, Department of Zoology, University of Oxford:

Personal support, travelling and research expenses for three years, to analyse the structure, function and evolution of facial signal patterns in a primate genus (*Cercopithecus*).

Dr. J. Patrick, Department of Medicine, St. Thomas's Hospital, London: Tropical Metabolism Research Unit, University of the West Indies, Jamaica:

Extension of his fellowship for four years, to study changes in intracellular water and electrolyte content in malnutrition.

Professor A. N. Radhakrishnan, Wellcome Research Unit, Christian Medical College Hospital, Vellore, India:

Travel and supplementary costs for a period of eighteen months in the United States, to study peptide and amino acid metabolism related to the terminal stages of protein digestion and absorption.

Dr. M. Rocha e Silva, University Medical School, São Paulo, Brazil: National Institute for Medical Research, Mill Hill, London:

Fellowship for three months, to continue a study of the pharmacological sensitivity of the ventral surface of the brain stem.

Dr. D. A. Warrell, Department of Medicine, Royal Postgraduate Medical School, London:

Additional support for one year, to study physiological disturbances associated with cerebro-spinal meningitis.

RESEARCH TRAINING SCHOLARSHIPS

Fourteen awards were made to junior postgraduate research workers for further research training.

VACATION SCHOLARSHIP

One vacation scholarship was awarded.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Professor G. A. O. Alleyne, Department of Medicine, University of the West Indies, Jamaica:

Research assistance, expenses and equipment for three years, to study renal metabolism and malnutrition.

Dr. T. G. Ashworth, Department of Medical Protozoology, London School of Hygiene and Tropical Medicine:

Grant to purchase animals and for other laboratory expenses, to study the significance of the chancre in African trypanosomiasis.

Professor D. J. Bradley, Ross Institute of Tropical Hygiene, London:

Research assistance for three years, to study genetic resistance to infection in rodent populations.

Dr. A. Bryceson, Hospital for Tropical Diseases, London:

Research assistance for fourteen weeks, to study the incidence and causes of diarrhoeal disease in overland travellers.

Dr. P. G. Cleland, Ahmadu Bello University, Zaria, Nigeria:

Personal support for one month and for small items of ancillary equipment, to study the techniques of carotid angiography.

Dr. G. G. Crane, Institute of Medical Research, Papua, New Guinea:

Research expenses, to study the anaemia of tropical splenomegaly syndrome.

Professor O. Fitzgerald, Department of Medicine and Therapeutics, University College, Dublin, Eire:

Research assistance for two years, to study the effects of the venom of the scorpion (*Tityus trinitatis*) on the gastrointestinal tract.

Professor W. S. Foulds, Tennent Institute of Ophthalmology, University of Glasgow:

Grant to provide materials for electron microscopy on baboon retina and optic nerve heads.

Dr. H. Foy, Nairobi, Kenya:

Secretarial assistance for twelve months, to complete publication of his work concerning his animal studies of pyridoxine and riboflavin relationship to immunity, aflatoxin and trypanosomiasis.

Dr. D. Franks, Department of Pathology, University of Cambridge:

Technical assistance and research expenses for three years, to study cellular immunological reactions to Leishmania.

Professor H. M. Gilles, Liverpool School of Tropical Medicine, and Professor D. A. Price Evans, Department of Medicine, University of Liverpool:

Research assistance and expenses over three years, to study the pharmacogenetics and pharmacokinetics of tropical drugs in different ethnic groups.

Dr. Audrey M. Glauert, Strangeways Research Laboratory, University of Cambridge:

Research assistance for three years, for electron-microscope studies on the mechanisms of cellular immunological reactions of schistosomula.

Dr. P. J. S. Hamilton, London School of Hygiene and Tropical Medicine:

Research assistance for three months in connection with the establishment of a section of Tropical Epidemiology.

Dr. Barbara J. Hawgood, Department of Physiology, Queen Elizabeth College, University of London:

Research assistance for two years, to study the neurotoxic components of the South American rattlesnake.

Professor H. de V. Heese, Department of Paediatrics and Child Health, University of Cape Town, South Africa:

Supporting staff and running expenses, to study the prevalence of asthma in black children in urban and rural Xhosa ethnic groups.

Dr. G. R. V. Hughes, Department of Medicine, Royal Postgraduate Medical School, London:

Research assistance and travel costs for three years, for genetic studies of systemic lupus erythematosus.

Professor M. S. R. Hutt, Geographical Pathology Department, St. Thomas's Hospital Medical School, London:

Technical assistance and expenses for a final three years, to study the tropical splenomegaly syndrome and glomerulonephritis in malaria and trypanosomiasis.

Dr. W. W. Macdonald, Department of Entomology, Liverpool School of Tropical Medicine:

Research assistance and expenses for a genetic study of the *Aedes s. scutellaris* sub-group of mosquitoes in relation to filariasis.

Professor G. M. O. Maloiy, Department of Animal Physiology, University of Nairobi, Kenya:

Equipment and research expenses for two years, to study thermoregulation, exercise, and heat and water balance in East African herbivores.

Dr. R. D. Martin, Wellcome Institute for Comparative Physiology, The Zoological Society of London:

Grant for building alterations to animal accommodation, research assistance and running expenses for three years, to study the reproductive biology of owl monkeys (*Aotus trivirgatus*).

Professor G. S. Nelson, Department of Medical Helminthology, London School of Hygiene and Tropical Medicine:

Research assistance for two years, to study parasite relationships in filarial infections.

Professor G. S. Nelson, Department of Medical Helminthology, London School of Hygiene and Tropical Medicine:

Research assistance and expenses for two years, to study cryopreservation of larval schistosomes.

Professor W. Peters, Department of Parasitology, Liverpool School of Tropical Medicine:

Grant towards the cost of two prints of a film, with soundtrack, on malaria in the orang-utan.

Dr. E. W. Price, London School of Hygiene and Tropical Medicine:

Research assistance, to complete his studies on the mineral content of human skin and lymph nodes in elephantiasis.

Professor T. Ramakrishnan, Indian Institute of Science, Bangalore, India:

Grant to purchase equipment and consumables, for biochemical studies of *Mycobacterium tuberculosis*.

Professor D. D. Reid, Tropical Epidemiology Unit, Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine:

Research assistance for six months, for interdisciplinary studies based on tropical epidemiology, statistics and computing relating to the field investigation of tropical diseases.

Professor D. D. Reid, Tropical Epidemiology Unit, Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine:

Grant for bridging support for Mr. T. F. de C. Marshall for six months, for collaborative studies in tropical epidemiology.

Dr. D. J. Rogers, Hope Department of Entomology, University of Oxford:

Research expenses, to study tsetse-fly behaviour and population ecology in Ethiopia.

- Dr. D. S. Rowe, W.H.O. Immunological Research and Training Centre, Lausanne, Switzerland:**
Grant to cover the expenses of a visit to Professor W. Peters' Department in Liverpool by Dr. J. Mauel and Dr. B. Sordat.
- Dr. D. S. Rowe, W.H.O. Immunological Research and Training Centre, Lausanne, Switzerland:**
Research expenses for one year, for immunological studies on leishmaniasis.
- Professor T. R. E. Southwood, Imperial College Field Station, Silwood Park, Berkshire:**
Personal support for Dr. R. Killick-Kendrick, technical assistance, equipment and expenses for four years, to study laboratory-bred phlebotomid sandflies and the development of *Leishmania* spp. in the fly.
- Professor M. D. Sntejo, Department of Child Health, Jakarta, Indonesia:**
Travelling expenses while undertaking immunological investigations of infantile gastroenteritis and malnutrition in Indonesia.
- Dr. G. E. Thomas, Department of Medicine, University of Rhodesia:**
Technical assistance and expenses for one year, to study the aetiology of sprue in Rhodesia in relation to intestinal bacterial flora or viruses.
- Dr. A. M. Tomkins, Clinical Nutrition and Metabolism Unit, Hospital for Tropical Diseases, London School of Hygiene and Tropical Medicine:**
Research assistance, expenses and equipment for two years, to study folate deficiency in tropical sprue.
- Professor J. L. Turk, Department of Pathology, Royal College of Surgeons of England, London:**
Support for Dr. Jill Curtis for three years, to study mechanisms of failure of the immune response in leprosy.
- Professor G. M. Urquhart, Wellcome Laboratories for Experimental Parasitology, University of Glasgow:**
Research assistance for three years, to study the host/parasite relationship in experimental trypanosomiasis.
- Dr. A. Voller, Nuffield Institute of Comparative Medicine, The Zoological Society, London:**
Expenses of a visit to New Guinea, to undertake field studies on the immunology of malaria.
- Professor J. C. Waterlow, Department of Human Nutrition, London School of Hygiene and Tropical Medicine:**
Bridging grant for seven and a half months for the support of a dietitian and cook, for studies in obesity and malabsorption.
- Dr. R. G. Whitehead, Dunn Nutritional Laboratory, Cambridge:**
Travelling expenses for Professor G. A. O. Alleyne, Dr. D. Picou, and Dr. R. Hay to visit Cambridge to finalise a book on protein-energy malnutrition.

Dr. W. Wilson, Department of Medicine, University of the West Indies, Jamaica:
Research assistance for three years, to study immunological aspects of systemic lupus erythematosus and other diseases in Jamaica.

Dr. Y. Yuthavong, Department of Biochemistry, Mahidol University, Bangkok, Thailand:

Grant for consumables and salary supplement for two years, to study the interaction of erythrocyte and other membranes with selected biomolecules.

SYMPOSIUM SUPPORT

Contribution towards expenses of a seminar on research and training in immunology related to tropical diseases, Nairobi, October 1975.

Contribution towards the cost of a symposium on the characterization, nomenclature and maintenance of salivarian trypanosomes, London, September 1976.

Contribution towards the cost of a symposium on American trypanosomiasis research, Belo Horizonte, Brazil, March 1975.

Contribution towards the travel costs of members of the Royal Society of Tropical Medicine and Hygiene to attend an Anglo-American meeting on tropical medicine, Philadelphia, November 1976.

TRAVEL GRANTS

Fares to enable eight medical students to visit the M.R.C. Research Laboratories in The Gambia.

EXPEDITIONS

Contribution towards the expenses of a University of Cambridge expedition to the Himalayas, to undertake genetic and high altitude studies.

Contribution towards the expenses of a University of Cambridge expedition to Kenya, to study kala-azar and malaria.

Contribution towards the expenses of a University of Cambridge expedition to Nigeria, to study albinism.

Contribution towards the expenses of a University of Cambridge expedition to Brazil, to study the epidemiology of Chagas' disease in selected populations around Brazilia.

Contribution towards the expenses of the Birmingham Biological Expedition to Africa, to study the relationship of primates to arboviruses in South-East Nigeria.

European Programme

The Trustees continued their policy of encouraging the interchange of research workers in Europe and they allocated over a quarter of a million pounds for this purpose during the past two years. The Trustees have agreements for interchange of Fellows between the United Kingdom and Denmark, Sweden, Norway, Finland and Hungary, but it will be seen from the list of awards below that Fellowships have been awarded for many countries with which there is no formal agreement.

It will also be seen that the Trustees have continued to encourage scientific interchange between the United Kingdom and Eastern Europe. In 1974 the Director of the Great Britain-East Europe Centre, Sir William Harpham, asked to meet Dr. Williams for discussions on the Trust's activities in promoting scientific interchange between Great Britain and East Europe. Sir William was particularly interested in increasing exchanges between Bulgaria and Romania, and in 1976 Dr. Williams and Dr. Bembridge were invited by the Bulgarian Ministry of Health to visit Sofia. In the hope of improving scientific relations in Bulgaria, an agreement was proposed to the Ministry of Health and the Academy of Sciences. These negotiations are still in progress.

Research is also supported by means other than the provision of fellowships, and the Trust's scheme for provision of grants of up to £1,000 annually for two years for the purpose of facilitating co-operation between laboratories has been very successful. This scheme enables scientists to visit and work in each other's laboratories, and to exchange materials. Approximately £24,000 has been provided for this purpose.

In addition to this, there are the Wellcome-Italian Research Travel Grants. These were established in 1970, to enable Italian scientists to make short visits of up to six weeks to the United Kingdom for the purpose of learning a technique or taking a specific part in a project. Since the scheme started, 40 grants have been made. All the supervisors of the Italian visitors have recently been asked for their comments on the value of these visits. The replies show that

such exchanges have been stimulating and useful, both to the visitor and the host department. Language problems have occurred on occasions, but these have been soon overcome.

The Trustees continued to provide support for one studentship annually at The Queen's College, Oxford, in memory of Lord Florey.

£271,500 have been allocated for European research projects during 1974-76

EUROPEAN COLLABORATION GRANTS

Professor R. W. Beard, Department of Obstetrics and Gynaecology, St. Mary's Hospital, London:

Costs of inter-laboratory collaboration for two years for studies in diabetes, particularly in relation to pregnancy, with research workers in Sweden and Belgium.

Professor R. Y. Calne, Department of Surgery, University of Cambridge:

Expenses of inter-laboratory collaboration, for studies in the immunology of liver transplantation, with research workers in Germany.

Dr. J. F. Davidson, Department of Haematology, Glasgow Royal Infirmary:

Expenses of inter-laboratory collaboration for two years, to develop an automated immuno-precipitin assay of human prothrombin, with research workers in France.

Dr. R. Dils, Department of Biochemistry, The Medical School, University of Nottingham:

Travelling expenses and air freight for a collaborative study of the control of milk fat synthesis with research workers at the University of Odense, Denmark.

Dr. H. Festenstein, Tissue Immunology Unit, The London Hospital Medical College:

Research expenses for two years, to continue to collaborate with European colleagues, to study genetic determinants and mechanisms of immune reactions in mice.

Dr. D. J. Griffiths, Department of Physics, University of Exeter:

Expenses for one year, for collaborative studies in urodynamics with the Technical High School, Aachen, West Germany.

Dr. J. Jeffery, Department of Biochemistry, University of Aberdeen:

Expenses of inter-laboratory collaboration, to study certain enzymes concerned in the transformation of steroids, with research workers in France.

Dr. M. I. M. Noble, Midhurst Medical Research Centre:

Expenses of inter-laboratory collaboration for three years, to undertake studies in the physiology of cardiac muscle, with research workers in Sweden and the Netherlands.

Professor H. Schneiden, Department of Pharmacology, Materia Medica and Physics, University of Manchester:

Expenses of collaborative research, to investigate the hypothesis that tryptamine receptors are present on cardiac sympathetic nerves, with the University of Mainz, Germany.

Dr. M. R. Ward, Muscular Dystrophy Group Research Laboratories, Newcastle upon Tyne General Hospital:

Grant to purchase drugs for collaborative research on the means whereby a muscle's integrity is maintained by its motor nerve, with the Czechoslovak Academy of Science, Prague.

Professor D. A. Willoughby, Department of Rheumatology and Experimental Pathology, St. Bartholomew's Hospital Medical College, London:

Travel expenses for inter-laboratory collaboration, for studies on the inflammatory response, with research workers in France.

Professor Eleanor Zaimis, Department of Pharmacology, Royal Free Hospital School of Medicine, London:

Expenses of collaborative research, to study the action of hypotensive drugs, with members of the Cardiovascular Institute, University of Milan.

Europeau Society for Clinical Investigation, The Netherlands:

Support for three years for the European Society for Clinical Investigation.

SUPPORT OF EUROPEAN SYMPOSIA AND WORKSHOPS

The Biochemical Society:

Grant towards the costs of the 10th International Congress of Biochemistry, Hamburg, July 1976 and for annual meetings of the Federation of European Biochemical Societies over the next three years.

Workshop and conference on genetic determinants and mechanisms of immune reactions in mice.

Bulgaria

RESEARCH FELLOWSHIPS

From Bulgaria

Dr. I. L. Bineva, Centre for Infectious and Parasitic Diseases, Academy of Medicine, Sofia: National Institute of Medical Research, Mill Hill, London:

Fellowship for one year, to study the mechanism of contact hypersensitivity.

Dr. J. L. Cvetanov, Centre for Infectious and Parasitic Diseases, Academy of Medicine, Sofia: National Institute of Medical Research, Mill Hill, London:
Fellowship for ten months, to study afferent lymph cells in contact sensitivity.

Dr. M. Setchenska, Central Laboratory of Biophysics, Bulgarian Academy of Sciences, Sofia: Department of Biochemistry, King's College, London:
Fellowship for one year, to study biochemical changes during erythroid cell differentiation.

Czechoslovakia

RESEARCH FELLOWSHIPS

From Czechoslovakia

Dr. K. Barnet, Charles University, Prague: Division of Immunology, M.R.C. Clinical Research Centre, Northwick Park, London:
Extension of his fellowship for one year, to study the control of the central stage of immune responses, with special reference to T cell response.

Dr. J. Herget, Department of Pathological Physiology, Faculty of Paediatrics, Charles University, Prague: Division of Academic Medicine, University of Sheffield:
Fellowship for six months, to study pulmonary hypertension in experimental lung disease.

Professor J. Korpas, Department of Patho-physiology, University Comeniana, Martin: Department of Physiology, St. George's Hospital Medical School, London:
Fellowship for three months, to study the histology and physiology of laryngeal nervous receptors in health and disease.

Dr. J. Krejci, Institute of Sera and Vaccines, Prague: Division of Immunology, M.R.C. Clinical Research Centre, Northwick Park, London:
Fellowship for one year, to study the chemistry and biological properties of antigen specific T cell products.

Dr. J. Rovensky, Department of Immunopathology, Piestany: Department of Medicine, University of Manchester:
Fellowship for one year, to study lymphocyte function in connective tissue disease.

Dr. S. Vybiral, Department of Comparative Physiology, Charles University, Prague: Department of Physiology, Trinity College, Dublin:
Fellowship for nine months, to investigate the causes of the rise in minimal heat production during the first 18 hours of life in the lamb.

Denmark

RESEARCH FELLOWSHIPS

From Denmark

Mr. S. Junker, Department of Plant Physiology, University of Aarhus: William Dunn School of Pathology, University of Oxford:

Research expenses during his Wellcome/Carlsberg Travelling Research Fellowship, to study mammalian cell biology.

Mr. F. M. Poulsen, Department of Chemistry, Carlsberg Laboratory, Copenhagen: Inorganic Chemistry Laboratory, University of Oxford:

Research expenses during his Wellcome/Carlsberg Travelling Research Fellowship, to study nuclear magnetic resonance spectroscopy of proteins in solution.

To Denmark

Dr. D. J. P. Ferguson, Department of Biology, University of Strathclyde, Glasgow: Department of Toxoplasmosis, Statens Seruminstitut, Copenhagen:

Extension of his European Travelling Fellowship for nine months, to continue studies on the development of *Toxoplasma gondii*.

Mr. A. A. Holder, Department of Genetics, University of Leeds: Department of Physiology, Carlsberg Laboratory, Copenhagen:

European Travelling Fellowship for one year and three months, to study the primary structure of ribulose-1,5-diphosphate carboxylase in wild type and mutant barley.

France

RESEARCH FELLOWSHIPS

From France

Dr. I. Brumpt, Department of Parasitology, Faculty of Medicine, University of Paris: Department of Microbiology, The London School of Hygiene and Tropical Medicine:

Fellowship for one year, to study biological activity of hepatitis B antigens in tissue culture systems.

Dr. C. J. Ojeda, INSERM, Lyon: Laboratory of Physiology, University of Oxford:

Fellowship for one year, to undertake studies on (a) isolation of ion transport material from cardiac muscle and, (b) analysis of cardiac glycoside action on cardiac muscle.

Dr. C. C. Wang, Paris: Queen Victoria Hospital, East Grinstead:

Extension of his fellowship for three months, to study the enhancement of kidney allograft survival.

To France

Miss M. E. McCall, Department of Pharmacology, Royal College of Surgeons, London: Unit of Analytical Radioimmunology, Institut Pasteur, Paris:
European Travelling Fellowship for one year, to study cellular aspects of inflammation by prostaglandin radio-immunoassay.

Germany

RESEARCH FELLOWSHIPS

From Germany

Dr. W. G. Burian, University of Bonn: Cardiothoracic Institute, London:
Fellowship for six months, to study factors influencing the intracellular distribution of calcium in hypertrophied and failing heart muscle.

To Germany

Dr. R. W. Glanville, Department of Medicine, Withington Hospital, Manchester: Max Planck Institute for Biochemistry, Munich:
Extension of his European Travelling Fellowship for one year, to undertake the purification and amino acid sequencing of type III collagen.

Dr. B. B. Lee, National Institute for Medical Research, Mill Hill, London: Max Planck Institute for Biophysical Chemistry, Gottingen:
Fellowship extension for two months, to undertake an analysis of single unit activity and functional architecture of monkey circumstriate cortex.

Greece

RESEARCH FELLOWSHIPS

From Greece

Dr. I. Agorastos, University of Thessalonika: Department of Medicine, Royal Free Hospital, London:
Fellowship for one year, to study the relationship of lecithin cholesterol acyl-transferase deficiency to lipoproteins in liver disease.

Dr. S. C. Manolagas, University of Athens: Department of Medicine, The Royal Infirmary, University of Manchester:
Fellowship for one year, to study adrenal androgen and oestrogen production and its relation to bone loss after oophorectomy.

GRANTS FOR RESEARCH EXPENSES

Dr. P. Kontomichalou, Department of Therapeutics, University of Athens:
Research expenses for one year, to study the epidemiology and genetics of drug resistance in bacteria.

Dr. A. A. Zacharoulis, Department of Cardiology, Hippokration Hospital, University of Athens Medical School:

Research expenses and equipment for one year, for a clinical assessment of stroke volume measurement using the pulse contour method in the pulmonary artery.

Hungary

RESEARCH FELLOWSHIPS

From Hungary

Dr. C. N. Dren, Veterinary Medical Research Institute, Hungarian Academy of Sciences, Budapest: Houghton Poultry Research Station, Huntingdon:

Extension of his fellowship for two months, to study the genetics of host response to Rous sarcoma virus infection and tumour development.

Mr. A. Fodor, Institute of Genetics, Biological Research Centre, Hungarian Academy of Sciences, Szeged: M.R.C. Laboratory of Molecular Biology, University of Cambridge Medical School:

Fellowship for one year, to study *Nematoda* genetics and developmental genetics.

Dr. G. Gacs, Department of Paediatrics, Medical School, Semmelweis University, Budapest: Paediatric Unit, St. Mary's Hospital Medical School, London:

Extension of his fellowship for four months, to study the absorption of calcium by animals and human infants.

Professor Dr. F. J. Hernadi, Department of Chemotherapy, Medical School, University of Debrecen: Department of Microbiology, School of Pharmacy, University of London:

Fellowship for one year, to study R factor elimination by DNA synthesis inhibiting agents.

Dr. Iren Kovacs, Department of Internal Medicine, Korvin Otto Hospital, Budapest: Department of Pharmacology, University of Cambridge Medical School:

Fellowship for one year, to study the mechanism of thrombus formation and its inhibition by drugs.

Dr. B. Lomniczi, Veterinary Medical Research Institute, Hungarian Academy of Sciences, Budapest: Department of Biological Sciences, University of Warwick, and National Institute for Medical Research, Mill Hill, London:

Fellowship for one year and three months, to undertake studies on biochemical events of negative-strand virus multiplication.

Dr. Z. Makoi, Department of Paediatrics, Medical School, Semmelweis University, Budapest: Department of Child Health, Southmead Hospital, University of Bristol:

Fellowship for one year, to study infant cry analysis during continuous positive airway pressure.

Dr. B. S. Ralovich, Institute of Microbiology, Medical School, University of Pecs: Department of Applied Biochemistry and Nutrition, School of Agriculture, University of Nottingham:

Fellowship for one year, to investigate the problems of Listeriosis.

Dr. G. Szabados, Institute of Biochemistry, Medical School, Semmelweis University, Budapest: National Institute for Medical Research, Mill Hill, London:

Fellowship for one year, to study the biochemistry and regulatory role of mitochondrial DNA.

Dr. B. Tarodi, Institute of Microbiology, Medical School, University of Szeged: Division of Virology, National Institute for Medical Research, Mill Hill, London:

Fellowship for one year, to study polypeptides induced in adenovirus infected chick fibroblast cells.

GRANTS FOR RESEARCH EXPENSES

Dr. M. Winter, Department of Pathophysiology, Medical School, Semmelweis University, Budapest:

Research expenses and equipment, to continue his studies of vitamin D.

Iceland

RESEARCH FELLOWSHIPS

From Iceland

Dr. B. Thjodleifsson, University Hospital, Reykjavik: Department of Medicine, Royal Free Hospital, London:

Fellowship for eleven months, to study methods of measuring serum bile acids, and the value of such measurements in the diagnosis of liver diseases.

Dr. H. Valdimarsson, University Hospital, Reykjavik: Department of Immunology, Royal Postgraduate Medical School, London:

Extension to his fellowship for three months, to study mechanisms of defects in cell-mediated immunity, and their relationship to persistent infection.

Italy

WELLCOME-ITALIAN TRAVEL GRANT SCHEME

Professor S. Garattini, "Mario Negri" Pharmacological Research Institute, Milan, Italy:

Travelling expenses of Italian research workers on short working visits to Britain

RESEARCH FELLOWSHIPS

From Italy

Dr. Anna Adinolfi, International Institute of Genetics and Biophysics, Naples: Department of Human Genetics and Biometry, University College London:
Fellowship for one year, to undertake biochemical, immunological and genetic studies of human alcohol dehydrogenase.

Dr. G. F. Bottazzo, University of Padua: Department of Immunology, Middlesex Hospital Medical School, London:
Fellowship for one year, to study organ specific autoimmunity to pancreatic islet cells in diabetes mellitus and to pituitary gland.

Dr. G. Ciofetta, Paediatric Clinic, University of Rome: Department of Medicine, Royal Postgraduate Medical School, London:
Fellowship for one year, to study the clinical application of ^{81m}Kr in the study of regional lung function of newborn and older infants.

Dr. F. Fazio, Medical Clinic, Pisa: Department of Medicine, Royal Postgraduate Medical School, London:
Extension of his fellowship for a further year, to study the determination of the regional content of extra-vascular lung water.

Dr. A. Postiglione, Department of Medicine, University of Naples: M.R.C. Lipid Metabolism Unit, London:
Fellowship for three months, to study the binding by circulating lymphocytes of human plasma low density lipoprotein.

The Netherlands

RESEARCH FELLOWSHIP

To the Netherlands

Dr. B. A. Bradley, Department of Immunology, University of Cambridge: University of Leiden:
Overseas allowances for five months, to continue his studies in the histocompatibility systems.

Norway

RESEARCH FELLOWSHIPS

From Norway

Dr. P. A. Brodal, Anatomical Institute, University of Oslo: Department of Human Anatomy, University of Oxford:
Research expenses for one year during his Wellcome/Jahre Travelling Research Fellowship, to study aspects of motor control.

**Dr. R. H. Westgaard, Institute of Neurophysiology, University of Oslo:
Department of Neurophysiology, National Hospital, Queen Square, London:**
Extension of his fellowship for one year, to study the effect of interruption of inputs to intercostal motoneurons.

Poland

RESEARCH EQUIPMENT

Professor R. Gryglewski, Department of Pharmacology, Copernicus Medical Academy, Cracow:

Grant for equipment, to study the generation of prostaglandins by vascular tissue.

Professor R. Gryglewski, Department of Pharmacology, Copernicus Medical Academy, Cracow:

Grant for equipment, to study biologically active substances generated from arachidonic acid by cardiovascular and respiratory systems.

Dr. J. Staszewska-Barczak, Laboratory of Neurophysiology, Polish Academy of Science, Warsaw:

Grant for equipment, to investigate the role of endogenous prostaglandin in the control of cerebral and coronary circulation.

RESEARCH FELLOWSHIPS

From Poland

Dr. J. A. Bryla, Institute of Biochemistry, University of Warsaw: Department of Biophysics, University College London:

Fellowship for four months, to study the transport of ornithine and citrulline across the mitochondrial membrane.

Dr. M. P. Dabrowski, Department of Pathophysiology, Institute of Rheumatology, Warsaw: Department of Experimental Pathology, University of Birmingham:

Fellowship for four months, to study the immunological reactivity of human cord blood lymphocytes and human thymocytes as judged by their performances in mixed cell reactions.

Dr. S. Majcherczyk, Warsaw Medical School: Sherrington School of Physiology, St. Thomas's Hospital Medical School, London:

Extension of his fellowship and research expenses for six months, to study the physiology of chemo-receptors.

Dr. R. T. Michalski, Institute of Haematology, Warsaw: Department of Surgery, King's College Hospital Medical School, London:

Fellowship for six months, to study factors influencing the promotion and dissolution of venous thrombi.

Dr. Barbara Wachowicz, University of Lodz: Department of Pharmacology, University of Cambridge:

Fellowship for four months, to study the isolation of receptors from blood platelets.

GRANT FOR RESEARCH EXPENSES

Professor D. Shugar, Institute of Biochemistry and Biophysics, Warsaw:

Research expenses for one year, to study properties of nucleic acids.

Romania

RESEARCH FELLOWSHIPS

From Romania

Dr. H. D. Bolosiu, Secoud Medical Clinic, Cluj: M.R.C. Rheumatism Research Unit, Taplow, Berkshire:

Fellowship for one year, to study the occurrence and nature of antibodies and circulating soluble immune complexes in Still's disease.

Dr. M. Dansoreanu, Department of Biophysics, Faculty of Medicine, University of Cluj-Napoca: Department of Chemistry, Chelsea College, University of London:

Fellowship for one year, to study biological membranes and methods for modulating membrane fluidity.

Spain

RESEARCH FELLOWSHIPS

From Spain

Dr. F. Cervero, University of Madrid Medical School: Department of Veterinary Physiology, Royal (Dick) School of Veterinary Studies, Edinburgh:

Fellowship for two years to study the spinal mechanism of somatosensory physiology.

Dr. A. Esteller, University of Granada: Physiological Laboratory, University of Cambridge:

Fellowship for six months, to study the effects of the withdrawal of food on the pancreas of the horse.

Dr. F. Garrido, University of Granada: Tissue Immunology Unit, The London Hospital Medical College:

Fellowship for one year, to study interactions between viruses and histo-compatibility antigens.

**Dr. M. A. Gassull, Department of Gastroenterology, University of Barcelona:
M.R.C. Gastroenterology Unit, Central Middlesex Hospital, London:**
Extension of his fellowship for one year, to study biochemical and clinical aspects of malnutrition, and malabsorption in chronic alcoholism and liver diseases.

Sweden

RESEARCH FELLOWSHIPS

From Sweden

**Dr. L.-A. Fransson, Department of Physiological Chemistry, University of Lund:
Department of Biological Sciences, University of Lancaster:**
Research expenses during his Wellcome-Swedish Travelling Research Fellowship, to study the structure and function of dermatan sulphate proteoglycans.

To Sweden

**Dr. M. A. Chester, Lister Institute of Preventive Medicine, University of London:
Institute of Medical Chemistry, University of Uppsala:**
Extension of his European Travelling Fellowship and research expenses for one year, to study the degradation of complex molecules in man.

**Dr. O. T. Phillipson, M.R.C. Neurochemical Pharmacology Unit, Cambridge:
Department of Anatomy, Karolinska Institutet, Stockholm:**
European Travelling Fellowship for one year, to study the organisation of, and afferent systems projecting to, the dopamine neurones of the midbrain ventral tegmental area.

Switzerland

RESEARCH FELLOWSHIPS

From Switzerland

**Dr. I. R. Baumann, Federal Technical University of Zürich: A.R.C. Institute of
Animal Physiology, Cambridge:**
Fellowship for six months, to study transmitters in the crossing inhibitory pathways in the hypothalamic neurone pools concerned in the central regulation of body temperature.

To Switzerland

**Dr. J. J. Doyle, Department of Veterinary Medicine, University of Glasgow:
W.H.O. Immunoglobulin Laboratories, Lausanne:**
Extension of his fellowship for six months, to study immunoglobulins and their functions in protection of the host against parasitic disease.

Yugoslavia

GRANT FOR RESEARCH EXPENSES

Dr. S. Gamulin, Institute of Patho-Physiology, University of Zagreb:

Research expenses for three years, to study the molecular mechanisms of steroid hormone action on tumours, and the effects of hypothermia on hepatic polysome structure and function.

Other Overseas Awards

The major part of the Trustees' overseas programme is concentrated on tropical medical research and European collaboration. Outside these areas the Trustees have maintained their Wellcome-Japanese Fellowship Scheme and they are prepared to consider applications to enable research workers from developed countries, who are already in the United Kingdom on fellowship grants, to extend their stay in order to complete a research project. The Trustees have decided to review their policy, during 1977, concerning the provision of fellowships to workers from Australia, Canada and New Zealand. Cut-backs in government research funding in those countries have made fellowships more difficult to obtain and the Trustees consider it important that this type of link with Commonwealth countries should be maintained.

During 1974-76 £102,000 was allocated for the following projects.

Argentina

RESEARCH FELLOWSHIPS

Dr. A. Florin-Christensen, Faculty of Medicine, University of Buenos Aires: Department of Immunology, Middlesex Hospital Medical School, London:
Extension of his fellowship for two months, to investigate the pathogenetic mechanisms in autoimmune diseases.

Dr. E. G. Lapetina, University of Buenos Aires: Department of Biochemistry, University of Birmingham:
Fellowship for six weeks, to study the increase in turnover of a single phospholipid (phosphatidylinositol).

Australia

RESEARCH FELLOWSHIPS

Dr. P. M. Beart, The John Curtin School of Medical Research, Australian National University, Canberra: M.R.C. Neurochemical Pharmacology Unit, Department of Pharmacology, Medical School, University of Cambridge:
Fellowship for three months, to study the function of amino acids in glial tissues.

Dr. J. E. Evans, University of Brisbane: Department of Medicine, Royal Free Hospital School of Medicine, London:

Fellowship for one year, to study the influence of diet on hyperbilirubinaemia in cholestasis and the hepatic uptake of organic anions, and the use of fibroblasts for studying genetics in Gilbert's syndrome.

Dr. J. L. Gollan, Royal Adelaide Hospital: Department of Medicine, Royal Free Hospital, London:

Extension of his fellowship for six months, to complete studies on the role of bile acids in renal clearance of bilirubin.

Dr. J. E. Moran, St. Vincent's Hospital, Melbourne: Department of Medicine, Royal Postgraduate Medical School, London:

Fellowship for two years, to study human glomerular C3b receptor in health and disease.

Dr. M. Stewart, University of New South Wales: M.R.C. Laboratory of Molecular Biology, Cambridge:

Extension to his fellowship for three months, to study the interactions between muscle proteins.

Dr. N. M. Thomson, Queen Elizabeth Hospital Renal Unit, Adelaide: Renal Unit, Royal Postgraduate Medical School, London:

Extension of his fellowship for three months, to complete a study of the mediators of allergic glomerular injury.

Dr. L. Wing, University of Sydney: Department of Clinical Pharmacology, Royal Postgraduate Medical School, London:

Fellowship for six months, to study human pharmacology and the clinical use of clonidine.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Dr. M. Sando, Department of Anaesthetics, Flinders University:

Special bridging grant for two years, to enable Dr. W. J. Russell to take up an academic post and undertake a programme of clinical and neurophysiological research in anaesthesia.

Professor K. W. Taylor, Department of Biochemistry, University of Sydney:

Research assistance for two months, to study the biosynthesis of insulin.

Chile

RESEARCH FELLOWSHIPS

Dr. S. Bartolotti, University of Chile, Santiago: Department of Medicine, Royal Postgraduate Medical School, London:

Extension of his W.H.O. fellowship for five months, to study methods of eluting antibody and immune complex from diseased tissue.

Dr. J. R. Corvalan, Department of Physiology, University of Concepcion: A.R.C. Institute of Animal Physiology, Cambridge:
Fellowship for one year, to study T lymphocyte differentiation.

RESEARCH EXPENSES

Professor A. L. Greenbaum, Department of Biochemistry, University College London:

Costs of inter-laboratory collaboration for two years, to continue studies on lactogenesis with Dr. M. Sapag-Hagar, University of Chile, Santiago.

Israel

RESEARCH FELLOWSHIPS

Dr. G. F. Inbar, Department of Electrical Engineering, Institute of Technology, Haifa: Department of Physiology, University of Oxford:

Fellowship for one year, to study learning in the muscle control system during voluntary controlled movements in monkeys.

Dr. A. Maoz, Israel: Department of Zoology, University College London:

Fellowship for six months, to study the purification and characterisation of antigen specific lymphocytes.

Dr. J. Shela, Hadassah Medical School, The Hebrew University of Jerusalem: Department of Anatomy, University College London:

Fellowship for one year, to study the significance of scanning and transmission electron microscopy in the study of bone remodelling.

Japan

RESEARCH FELLOWSHIPS

Dr. I. Kanazawa, Faculty of Medicine, University of Tokyo: M.R.C. Neurochemical Pharmacology Unit, Department of Pharmacology, The Medical School, University of Cambridge:

Fellowship for one year, to study transmitter systems in anatomically defined regions of the nervous system.

Dr. K. Kitajima, Department of Medical Chemistry, Faculty of Medicine, Kyoto University: Department of Immunology, National Institute of Medical Research, Mill Hill, London:

Wellcome-Japanese Fellowship for two years, to undertake molecular biological studies of immunoglobulin synthesis.

Dr. F. Mekata, Department of Physiology, Primate Research Institute, University of Kyoto: Department of Physiology, The London Hospital Medical College:

Fellowship for six months for electrophysiological studies of the smooth muscle of the rabbit aorta.

Dr. T. Ohtawa, Department of Surgery, Tokyo University Hospital: Department of Surgery, Addenbrooke's Hospital, University of Cambridge:
Wellcome-Japanese Fellowship for two years, to undertake a surgical, physiological and immunological study of hepatic transplantation.

Dr. S. Shoji, Third Department of Internal Medicine, Faculty of Medicine, University of Shinshu: Department of Neurology, University of Newcastle upon Tyne:

Wellcome-Japanese Fellowship and research expenses for two years, to undertake a biochemical study of muscle protein in steroid myopathy and muscular dystrophy.

Dr. N. Ueda, University of Hokkaido: Department of Physiology, University of Dundee:

Wellcome-Japanese Fellowship and research expenses for two years, to study the mechanism of hormone and neurotransmitter action on gland cells.

New Zealand

SYMPOSIUM SUPPORT

Symposium on genetic hypertension in the rat, Dunedin, March 1976.

U.S.A.

RESEARCH FELLOWSHIPS

Dr. B. R. Martin, Department of Pharmacology, University of North Carolina: Department of Pharmacology, University of Oxford:

Fellowship for six months, for an investigation of cannabis metabolism.

Mr. W. T. Mason, Case Western Reserve University, Cleveland, Ohio: Physiological Laboratory, University of Cambridge:

Extension of his fellowship for one month, to study the ionic basis of visual excitation.

ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES OF AMERICA

The Sir Henry Wellcome Medal and Prize awarded to Medical Officers of the Armed Forces of the United States of America or of the U.S. Public Health Service.

Instituted by Sir Henry Wellcome in 1916

The Medal and Prize are awarded by the Council of the Association of Military Surgeons of the United States of America, Washington, D.C., for an essay or report on original research dealing with military applications of medicine.

- 1975 Lieutenant-Commander John R. Lucas, U.S. Navy Pharmacy Service, for his essay entitled "A Survey of Drug Formularly Procedures in Naval Hospitals and the Feasibility of Change".
- 1976 Lieutenant-Commander Robert Shaw, Jr., MC, U.S. Naval Reserve, for his essay entitled "Preventive Medicine in the Vietnamese Refugee Camps on Guam".

Sir Henry Wellcome Travelling Research Fellowships

In July 1976 the Trustees ended their scheme of Sir Henry Wellcome Travelling Research Fellowships which was started in 1961. During this time 71 awards were administered on behalf of the Trust by the Medical Research Council. With the growth of the Trust's office, the need to delegate awards no longer exists and the Trustees have therefore decided to discontinue this fellowship scheme. They are willing to consider proposals from any of their senior fellows who wish to spend a year in an overseas research centre during the tenure of their fellowships.

The quality of the recipients of these awards is illustrated by the fact that no less than 47 out of the 66 former fellows are currently in academic or research posts; only six have emigrated.

Dr. T. A. Bramley, Endocrine Department, Women's Hospital, Birmingham: Mayo Clinic, Minnesota, U.S.A.:

To study the isolation and mechanisms of activation of corpus luteum gonadotrophin receptors.

Dr. R. W. F. Campbell, Royal Infirmary, Edinburgh: Duke University Medical Center, North Carolina, U.S.A.:

To study the nature of ventricular impulse formation and propagation in ischaemic tissue.

Dr. R. H. Cooper, Department of Biochemistry, University of Bristol: Department of Biological Chemistry, University of California, U.S.A.:

To study the regulation of cyclic AMP dependent protein kinase.

Dr. B. Fowler, Royal Manchester Children's Hospital: Department of Human Genetics, Yale University, U.S.A.:

To study the purification and characterisation of cystathionine synthase from cultured skin fibroblasts of homocystinuric patients.

Dr. S. Tomlinson, The Middlesex Hospital, London: Department of Biology, Massachusetts Institute of Technology, U.S.A.:

To study messenger RNA and the mechanism of protein biosynthesis.

Venezuela

RESEARCH FELLOWSHIP

**Dr. G. Whitembury, Latin American Centre of Biological Sciences, Caracas:
Department of Physiology, University of Cambridge:**
Fellowship for one year, to study the coupling of ion and fluid transport in
necturus kidney tubule.

Travel Grants

Travel grants have been awarded to enable 346 research workers to visit various parts of the world, at a cost of £73,588.

C. VETERINARY AND COMPARATIVE MEDICINE

It is eight years since the Trustees appointed their first Panel to advise them on the support of research in veterinary and comparative medicine. The funds available for allocation in this field have varied between £200,000 and £300,000 per annum. Both the original Panel and its successor advised the Trustees that it was especially important that they should provide research training scholarships and fellowships to encourage recruitment to the veterinary research field. Approximately £100,000 per annum has been expended for this purpose since 1968. Forty-two research training scholarships and thirty-seven fellowships have been awarded; nine fellowships are still current, and of the previous twenty-eight holders, twenty-five have obtained academic or research posts. The success rate of scholars in obtaining such posts has been less striking but, nevertheless, sufficient to justify these awards.

The balance of the budget has been used for project support, mostly in response to individual applications. The Panel has, however, held meetings from time to time to consider fields that might merit special attention, either because they were neglected or because they were of great importance. With this in mind, during the past year the Panel has examined the subjects of toxicology, dermatology and mycology. The opinions expressed at these meetings were very valuable and the following conclusions were drawn:

In the field of toxicology two areas merited particular support:

- 1) Toxicology studies in the ruminant.
- 2) Chemical studies on plant toxins (this topic would span the comparative field of human and animal medicine).

In comparative and veterinary dermatology it was agreed that not only was there a lack of an adequate career structure, but a lack both of basic information and a common nomenclature for skin disorders in human and animal medicine.

Mycology received less priority from the Panel than the other selected fields, but they considered that work on mycotoxins was most important and that this type of research could be considered as a branch of toxicology.

A meeting on small animal research held in October 1975 brought out the lack of activity in this field and emphasized the need for more research into veterinary dermatology. Unfortunately the restricted budget for veterinary research has meant that there have been insufficient funds to implement these proposals to any marked extent. Nevertheless two of the larger grants awarded during the period under review were made for toxicological studies. Professor E. A. Bell in the Department of Botany at King's College, London, is determining physiologically active amines, cyanogenic glycosides and alkaloids in the seeds of leguminous plants. Dr. A. T. Diplock in the Department of Biochemistry at the Royal Free Hospital is studying the interaction of selenium with vitamin E, silver, mercury and cadmium. Both these areas of toxicological study were selected as being of particular importance during the meeting on toxicology.

Professor I. A. Silver was given support for three years to study renal fibrosis and renal dysplasia. He is using the cat as a model, having provided evidence in a pilot study that the cat would prove a suitable subject for this investigation.

In January 1976 the Panel discussed their overall approach to research on the basis of a talk given by Sir Michael Swann, based on the report of a Committee of Enquiry into the Veterinary Profession, which had met under his Chairmanship. He drew attention especially to the need for more information on economic loss through disease of animals and the lack of research on the welfare of farm animals. He expressed the need for closer collaboration between university departments and research institutes.

Professor Thompson and Sir Michael Swann attended the opening of the laboratory for research into comparative anaesthesia that had been built at the Bristol Veterinary School for the research of Dr. Barbara Weaver.

The Trustees have now decided, on the proposal of Professor R. H. S. Thompson, who has been Chairman of the Veterinary Panel since its inception, that Sir Michael Swann should succeed him. Sir Michael Swann has proposed that the Trustees should re-examine their overall policy in this field since the present restricted budget has unduly limited its activities. A study will be undertaken during the coming year.

Mr. P. D. Rossdale, a veterinary surgeon in practice, joined the Panel in October 1974.

Grants totalling £333,697 were allocated during 1974-76.

UNIVERSITY AWARD

Dr. A. O. Betts, Royal Veterinary College, London:

Support for a Lecturer for two years, to study the behavioural regulation of sodium intake and its importance in electrolyte balance, particularly in the ruminant.

RESEARCH EQUIPMENT

Dr. R. Archer, A.H.T. Equine Research Station, Newmarket:

Contribution towards the purchase of equipment to measure thyroid and gastrointestinal function of the horse.

Dr. F. C. Flack, Department of Physics, University of Exeter:

Grant to purchase equipment, to investigate respiratory physiology, weight bearing and intra-abdominal pressure in the horse.

Dr. B. J. Sheahan, Trinity College, Dublin, Eire:

Contribution towards the purchase of equipment for an investigation into GM, gangliosidosis in Friesian calves.

RESEARCH FELLOWSHIPS

Mr. R. M. Batt, Department of Medicine, Royal Postgraduate Medical School, London:

Fellowship for three years, to study small intestinal mucosal disorder in the dog.

Mr. D. H. Lloyd, Department of Physiology, Hannah Research Institute, Ayr:

Fellowship for one year, to study the defence mechanisms operating at the skin surface in cattle.

Dr. J. L. Mackey, Department of Veterinary Pathology, University of Glasgow: W.H.O. Immunology Research Centre, Geneva, Switzerland:

Fellowship for one year, for immunological studies of leukaemia and related diseases.

**Dr. M. Murray, Department of Veterinary Pathology, University of Glasgow:
W.H.O. Immunopathology Research Unit, Division d'Hématologie, Cantonal
Hospital, Geneva, Switzerland:**
Partial fellowship support for nine months, for a study of the immunological
mechanisms in parasitic disease.

RESEARCH TRAINING SCHOLARSHIPS

Ten awards were made to junior postgraduate research workers for further
research training.

VACATION SCHOLARSHIPS

Two vacation scholarships were awarded.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

**Dr. D. Allan, Department of Veterinary Pathology and Bacteriology, University
of Liverpool:**
Research assistance and expenses for two years, for experimental studies of the
host immune mechanisms and enhancement of underlying cellular responses
to bacterial lipo-polysaccharide administered as antigens or as adjuvants.

**Dr. K. P. Baker, Department of Veterinary Clinical Practice, Trinity College,
Dublin, Eire:**
Research assistance and expenses for one year, to investigate mane and tail
eczema (sweet itch) in horses.

Professor E. A. Bell, Department of Botany, King's College, University of London:
Research assistance and expenses for three years, for the determination of
physiologically active amines, cyanogenic glycosides and alkaloids in the seeds
of leguminous plants.

Brigadier J. Clabby, Animal Health Trust, London:
Support for Dr. B. Bagnall, technical assistance, expenses, equipment and build-
ing conversion costs over three years, to enable him to develop veterinary
dermatology and to undertake research into the histopathological classification
of veterinary skin disorders. At the end of the first year of the Trustees' support
Dr. Bagnall resigned from this appointment.

**Dr. A. T. Diplock, Department of Biochemistry, Royal Free Hospital School of
Medicine, London:**
Research assistance and expenses for three years, to study the interaction of
selenium with vitamin E and with silver, mercury and cadmium.

Professor T. K. Ewer, Department of Animal Husbandry, University of Bristol:
Research assistance and expenses for eight months, to study the biosynthesis,
structure and immunochemistry of collagen.

Dr. I. Griffiths, Department of Veterinary Surgery, University of Glasgow:
Research assistance and expenses for three years, to study the physiological and ultra-structural features of the venous changes that occur in the spinal cord following experimental injury.

Dr. L. W. Hall, Department of Clinical Veterinary Medicine, University of Cambridge:

Bridging grant for research assistance for six months, to undertake anaesthetic and cardiopulmonary research in horses.

Dr. D. E. Jacobs, Department of Microbiology, Royal Veterinary College, London:
Research assistance and expenses for two years, to study the pathogenicity of hookworm infections in greyhounds.

Professor W. F. H. Jarrett, Department of Veterinary Pathology, University of Glasgow:

Research assistance for three years, for an immuno-electronmicroscope study of cell membrane antigens and the relationship of their expression to the cell cycle.

Professor P. A. Jewell, Department of Zoology, Royal Holloway College, University of London:

Research assistance and expenses for one year, to study disease relations and population dynamics of suburban foxes.

Mr. R. S. Jones, Department of Anaesthesia, University of Liverpool:

Research assistance and expenses for one year, to study the duration and intensity of the neuromuscular block produced by suxamethonium chloride in the dog and its modification by anticholinesterase drugs.

Dr. D. E. Noakes, Department of Surgery and Obstetrics, Royal Veterinary College, London:

Research expenses for three years, to study the functional potency of the fallopian tube in domestic species.

Dr. R. J. Roberts, Unit of Aquatic Pathobiology, University of Stirling:

Technical assistance and expenses for two years, to study the cellular kinetics of teleost fish epidermis.

Mr. M. Robinson, Department of Veterinary Pathology, University of Liverpool:
Research expenses for three years, to study the correlation of structural and functional changes in experimentally produced nephrotoxicity in sheep.

Mr. P. D. Rossdale, Newmarket:

Research expenses for one year, to measure oesophageal, jugular venous and systemic arterial pressures in pony foetuses during induced delivery and the onset of respiration.

Mr. P. D. Rossdale, Newmarket:

Research expenses, to study the initiation of lactation in the mare.

Professor I. A. Silver, Department of Pathology, University of Bristol:
Research assistance and expenses for three years, to study renal fibrosis and renal dysplasia.

Dr. G. R. Smith, Nuffield Institute of Comparative Medicine, The Zoological Society of London:
Research expenses and assistance for three years, to continue his ecological and experimental studies on botulism in waterfowl.

Dr. S. E. Solomon, Department of Veterinary Histology and Embryology, University of Glasgow:
Research expenses for two years, to study shell stability as influenced by thick white deposition.

Dr. D. Steven, Sub-Department of Veterinary Anatomy, University of Cambridge:
Research assistance and expenses for three years, to study electron microscopical aspects of placental structure.

Dr. J. A. Taylor, Department of Geography, University College of Wales, Cardiff:
Research expenses, to study the occurrence of liver fluke disease in mid-Wales.

Mr. C. B. Turner, General Practice, Exeter:
Research expenses for one year, to study papillomata-like lesions on the placenta of sheep.

Professor G. M. Urquhart, Wellcome Laboratories for Experimental Parasitology, University of Glasgow:
Bridging support for six months, to study individual and breed resistance to *Haemonchus contortus* infection in sheep, and their immunological unresponsiveness.

Professor G. M. Urquhart, Wellcome Laboratories for Experimental Parasitology, University of Glasgow:
Technical assistance for three years, to undertake an investigation into haemonchosis in lambs.

Dr. B. Weaver, Department of Veterinary Surgery, University of Bristol:
Research assistance, expenses and equipment for three years, to study the uptake and distribution of inhaled anaesthetics in large animals.

Dr. B. Weaver, Department of Veterinary Surgery, University of Bristol:
Part-time research assistance for one year, to study the uptake and distribution of inhaled anaesthetics in large animals.

Dr. T. D. Whyte, Department of Physics, University of Exeter:
Research expenses for one year, to develop a portable pressure transducer for non-invasive pressure measurements inside fluid-filled organs.

Dr. N. G. Wright, Department of Veterinary Pathology, University of Glasgow:
Research expenses for three years, to study canine adenoviruses.

SYMPOSIUM SUPPORT

Symposium on the comparative biology of the skin, London, October 1975.

25th Easter School and 3rd International Symposium in Agricultural Science, Loughborough, April 1976.

TRAVEL GRANTS

Eighteen travel grants were made to enable veterinary research workers to make visits abroad to meet their colleagues or to collaborate in research programmes.

D. HISTORY OF MEDICINE

Wellcome Institute for the History of Medicine

In the Trust's last report in 1974 major proposals affecting the Wellcome Institute were described. The first concerned the establishment of an academic unit in the Institute in order to use its unique facilities as an international centre for the academic study of the history of medicine. In order to achieve this it has been necessary to seek a University affiliation so that the staff of the Unit have the necessary academic status. The Trust and the Institute have close links with University College London through the Sub-Department of the History of Medicine at University College which was established by the Trust in 1966. Negotiations with the College and University authorities have led to a scheme for association. In future staff will be appointed to the academic unit by a joint academic committee which will consist of representatives of University College, the Wellcome Trust and the Wellcome Institute. Under this arrangement the links with University College will be strengthened and it is envisaged that the College's Sub-Department will move into the Wellcome Institute for all its research activities while retaining some teaching facilities in the College.

To make this academic development possible at the Wellcome Institute the Trustees have placed the Wellcome museum collection on indefinite loan with the Science Museum. The completion of negotiations was announced by Lord Donaldson of Kingsbridge, Minister for the Arts, Education and Science, at a Press Conference on 22nd June, 1976. The Department of Education and Science has recently appointed Dr. Brian Bracegirdle as Keeper of the collection, which will be housed in a new gallery, now under construction, which will be known as the "Wellcome Museum of the History of Medicine". The Trustees will be appointing a Senior Research Fellow, who will be a member of the staff of the Institute's academic unit, to undertake research on the Wellcome collection at the Science Museum. The activities of the Wellcome Museum will be supervised by a Committee to be chaired by Lord Franks. The detailed

proposals for this development were set out in the Trust's 10th Report.

During the last two years the negotiations required for this re-organisation have been completed and a new phase in the development of the Trustees' involvement in the history of medicine is about to start.

While these negotiations have been under way the Institute's other activities have continued and the accent has been on the increase of academic research by the staff and visiting workers. During the period of this report the Trustees have supported nine post-doctoral research fellows, and four research students at the Wellcome Institute. Seven part-time research workers have also been associated with the Institute.

The Institute's medical historian, Dr. J. K. Crellin, was appointed to the post of Associate Professor of the Medical Humanities in the University of Southern Illinois Medical School at Springfield, Illinois. A temporary archivist was appointed in November 1975 to sort and arrange the Institute's records.

An agreement has been reached with the Royal Society of Medicine whereby they will loan part of their library to the Wellcome Institute Library for a period of at least ten years. The loan comprises a collection of some 20,000 volumes dealing with medicine, pharmacy and dentistry, the majority published in the nineteenth century. The acquisition of these volumes on loan will greatly enhance the scope and versatility of the Wellcome Institute Library.

*Staff of the
Wellcome Institute for
the History of Medicine
(as at 31st August, 1976)*

Director:

Edwin Clarke, MD, FRCP

Administration:

G. Wilson, FCIS, Secretary

Evonne A. Garton, ACIS, Professional Assistant

Library:

E. J. Freeman, BA, ALA, Librarian

R. M. Price, MA, ALA, Deputy Librarian

H. R. Denham, FLA, Chief Cataloguer

Patricia M. Hully, BA, FLA, Assistant Librarian

Brenda Sutton, BA, ALA, Assistant Librarian

H. J. M. Symons, MA, ALA, Assistant Librarian

Marianne Winder, MA, ALA, Assistant Librarian

Enid M. Slatter, BSc, Research Assistant

Museum:

C. A. Sizer, BSc, FGS, FMA, Curator

Linda A. Deer, MA, Assistant

Department of Prints and Drawings:

Renate Burgess, PhD, Head

W. M. Schupbach, MA, Assistant

University Development of Medical History

The period under review has been one of consolidation for the three Wellcome units.

Sub-Department of the History of Medicine, University College London

Dr. W. F. Bynum heads this Sub-Department which is now supported jointly by University College and the Wellcome Trust. The major change in the structure of the Sub-Department has been the appointment of Dr. M. J. Bartholomew to a Lectureship, on a three-year grant from the Trust, from 1st October 1974. This has enabled the teaching programme to be expanded, with courses at both the undergraduate and postgraduate levels. Among the various courses offered, a new one-year MSc course was started in 1975–76. It is given jointly with the Department of the History and Philosophy of Science. Dr. Bynum also provides a one-year intercalated BSc course in the history of science and medicine for medical students from London medical schools. Dr. Bynum, Dr. Bartholomew and other research workers attached to the Sub-Department have given lectures and seminars at a number of universities in the United Kingdom and in the United States.

All the members of the Sub-Department and its associated workers are actively engaged in independent research programmes and some eighteen papers have been published during the past two years.

Wellcome Unit for the History of Medicine, University of Oxford

This Unit has now been established for four years; its Management Committee includes representatives of the Faculties of Modern History, Clinical Medicine and Physiological Sciences. Dr. C. Webster, the Reader in charge of the Unit, has delivered lectures to undergraduate and postgraduate students in Oxford and has also lectured in Italy and the Netherlands. He supervises a number of postgraduate students, one of whom is supported by the Trust.

The members of the Unit continue to be actively engaged in research and Dr. Webster's study of seventeenth century science, medicine and social reform, *The Great Instauration: Science, Medicine and Reform 1626-1660*, was published in 1975. He has also contributed to several other forthcoming medical and historical books and, together with the Unit's Research Assistant, Miss Margaret Pelling, has edited the *Linacre Studies* volume, which is soon to be published. Miss Pelling has completed her thesis on Victorian Medicine and publication is planned.

The University has provided accommodation for the Unit at No. 47 Banbury Road which, after extensive renovation and redecoration, was taken over by the Unit early in 1976. The new quarters provide space for offices, a library and a small teaching room.

*Wellcome Unit for the History of Medicine,
University of Cambridge*

During the period under review the Cambridge Unit has moved to accommodation in Free School Lane in the building occupied by the Department of History and Philosophy of Science and the Whipple Museum. Dr. R. K. French took up the post of Assistant Director of Research and Head of the Unit from 1st January 1975. Together with the Assistant Lecturer, Dr. K. Figlio, he has been able to introduce the history of medicine into both the Natural and Medical Sciences Tripos at a general and more specialised level. The history of medicine is also taught as part of the one-year postgraduate Diploma in the History and Philosophy of Science. The members of the Unit have taken an active part in various seminars in Cambridge and London as well as continuing with their own research.

Co-operation and the interchange of ideas between the Units and with the Wellcome Institute have been fostered by regular joint seminars at each centre.

Interest in the establishment of Lectureships in the History of Medicine has been shown by a number of other universities.

Grants in support of the History of Medicine

The priorities outlined in the Trust's 10th Report for the provision of grants have been continued. During the period under review, ten fellowships and five research training scholarships have been awarded. The sum of £50,000 per annum has continued to be available for the grants programme but an extra-budget amount was granted to the East Asian History of Science Trust for the continued production of Dr. Joseph Needham's series on *Science and Civilisation in China*. The Trustees have already provided considerable support for this project during the past twenty years.

£785,413 has been allocated for the support of the History of Medicine during the period under review. This sum includes the Wellcome Institute and the Wellcome Units.

During the coming year the History Panel will be reviewing the Trust's policy for the support of the History of Medicine to see what further initiative may be possible to promote this topic.

RESEARCH EQUIPMENT

Dr. A. Macfarlane, Department of Social Anthropology, University of Cambridge: Grant to purchase components associated with the operation of a computer programme, to study age-specific mortality over long periods using the total reconstitution method.

RESEARCH FELLOWSHIPS

Dr. A. R. Cunningham, Wellcome Institute for the History of Medicine, London: Extension of his fellowship for one year, to study the relationship between the teaching of medicine and medical thought from the sixteenth to the eighteenth centuries.

Dr. W. D. Hackmann, Museum of the History of Science, University of Oxford: Extension of his fellowship for three months, to complete his study of medico-electrical instruments in the eighteenth and nineteenth centuries and to catalogue the relevant material in the Wellcome Institute.

Dr. Elizabeth Haigh, Department of the History of Science, Saint Mary's University, Halifax, Nova Scotia, Canada: Wellcome Unit for the History of Medicine, University of Cambridge: Personal support and expenses for one year, to study Montpellier and the Vital Theory in the Eighteenth Century.

Dr. F. Klein-Franke, Hebrew University of Jerusalem, Israel: Wellcome Institute for the History of Medicine, London:

Fellowship for one year, to prepare a translation and commentary on *A Practical Manual of Astrological Medicine* by Ibn as-Salt.

Mr. I. M. Lomie, University of Otago, New Zealand: Wellcome Institute for the History of Medicine, London:

Fellowship for one year, to study distinction between schools in early Greek medical theory and practice.

Dr. Pauline Mazumdar, Institute of the History of Medicine, Johns Hopkins University, Baltimore, U.S.A.: Wellcome Institute for the History of Medicine, London:

Fellowship for one year, to study the work of the statistician and geneticist R. A. Fisher.

Mr. B. J. Norton, Department of Statistics, University College London: Sub-Department of the History of Medicine, University College London:

Fellowship for six months, to study the biometric school and its influences on the social sciences.

Dr. P. E. Razzell, Bedford College, University of London: Wellcome Institute for the History of Medicine, London:

Fellowship for one year, to evaluate the role of smallpox prophylaxis and the improvement of personal hygiene in reducing mortality during the eighteenth and nineteenth centuries in Great Britain.

Dr. C. H. Talbot, Wellcome Institute for the History of Medicine, London:

Fellowship for a final two years, to complete his work on medicine in medieval Europe.

Dr. K. H. Veltman, Warburg Institute, London: Wellcome Institute for the History of Medicine, London:

Fellowship for two years, to study Leonardo da Vinci's experiments and sources of information on the physiology of vision.

RESEARCH TRAINING SCHOLARSHIPS

Five awards were made to junior postgraduate research workers for further research training.

GRANTS FOR RESEARCH EXPENSES AND ASSISTANCE

Mr. P. G. Burbidge, East Asian History of Science Trust, University of Cambridge: Grant for expenses over three years, to continue production of Dr. Joseph Needham's *Science and Civilisation in China*.

Dr. K. D. Keele, Staines, Middlesex:

Grant for research expenses, to complete his study of Leonardo da Vinci's scientific work.

Royal Microscopical Society, Clarendon House, Oxford:

Removal costs of the Royal Microscopical Society to new premises in Oxford.

Mr. G. L'E. Turner, Museum of the History of Science, University of Oxford:

Research assistance and expenses for up to four years, to prepare a comprehensive descriptive catalogue of the collections of microscopes belonging to the Museum of the History of Science, University of Oxford, the Royal Microscopical Society, the Science Museum, and the Wellcome Institute.

Mr. P. J. Wallis, School of Education, University of Newcastle upon Tyne:

Research assistance, to prepare a historical bio-bibliography of eighteenth century medical personnel.

Professor A. P. Waterson, Department of Virology, Royal Postgraduate Medical School, London:

Research assistance for one further year, to complete research for a history of virology.

SYMPOSIUM SUPPORT

Contribution towards the cost of attendance and publication of the results of a symposium on Health and Medicine in Africa during the Colonial Period, Oxford, Spring 1977.

Contribution towards the expenses of a conference on biological history, Cambridge, September 1975.

GRANTS IN AID OF PUBLICATION

Dr. G. C. Ainsworth, Delabole, Cornwall:

Grant to enable him to include a coloured illustration in a book entitled *Introduction to the History of Mycology*.

Dr. B. H. Kean, Division of Infectious Diseases, Department of Medicine, The New York Hospital, Cornell Medical Center, U.S.A.:

Contribution towards the publishing costs of a book entitled *Classics in Medical Parasitology*.

Colonel H. W. Mulligan, Department of Biology, University of Salford:

Expenses over three years, to prepare a book on the original contributions to science made by officers of the Indian Army and Medical Service.

Dr. W. Pagel, London:

Expenses in connection with the publication of *New Light on William Harvey*.

Dr. A. H. T. Robb-Smith, University of Oxford:

Contribution towards the expenses of preparing a *History of the Oxford Medical School* for publication.

Professor Sir Hugh Robson, Faculty of Medicine, University of Edinburgh:
Contribution towards the publishing costs of a book by Dr. E. Ashworth Underwood entitled *Boerhaave's English-Speaking Alumni*.

Professor Sir Hugh Robson, Faculty of Medicine, University of Edinburgh:
Contribution towards the costs of a film on the history of the Edinburgh Medical School for the 250th anniversary of the Faculty of Medicine.

TRAVEL GRANTS

Three grants were made for travel in connection with research in the history of medicine.

III. THE TRUSTEES AND THEIR STAFF

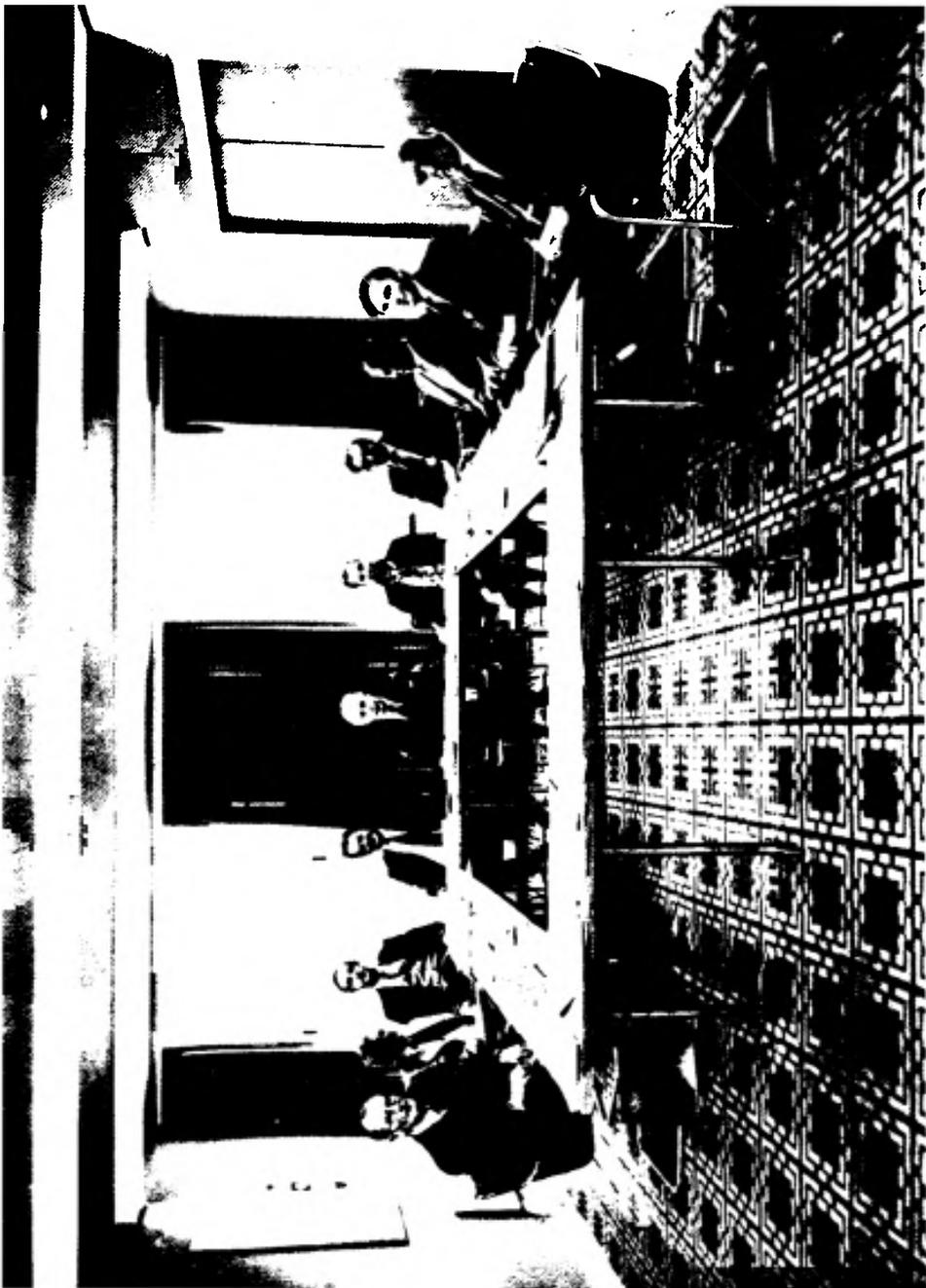
There have been no changes in the membership of the Board of Trustees or the senior staff during the past two years. We are, however, pleased to report that The Rt. Hon. the Lord Armstrong of Sanderstead was appointed Chairman of the Midland Bank Limited. Dr. Edda Hanington was elected a Member of the Royal College of Physicians. A notable event was the celebration of the centenary of the birth of Sir Henry Dale (Chairman of the Trust, 1938–1960) at a joint meeting of the Physiology and Pharmacology Societies held in Cambridge in September 1975. Dr. Williams spoke of Sir Henry's role in the initial years of the Trust.

The new office of the Trust is now fully functional and has added considerably to the working efficiency through the additional facilities available.

During the period 13–22 May, 1975, an Exhibition of research supported by the Trust was held to mark the move to the new premises in Park Square West. This Exhibition was attended by many people connected with the Trust's activities and subsequently was shown at The Wellcome Building, Euston Road, and the University of Manchester. It portrayed the growth, development and policy of the Trust and many of the projects that have been supported during the past forty years. We are very grateful to all those who prepared the material for the Exhibition and for the work of the staff in the elaborate process of mounting such a collection.

Regular meetings have been held at which grantholders present their work in progress and educational video-tapes are also shown for the benefit of the local administrative medical community. These have proved to be excellent ways of enabling the Trustees and staff to follow the progress of research being supported and to keep in touch with advances in medicine.

It is also important to maintain contact with Units overseas and therefore, during the past two years, visits have been made by Sir John McMichael (Brazil), Dr. C. E. Gordon Smith (Kenya), Dr. P. O. Williams (Brazil) and Dr. B. E. C.



A meeting of the Veterinary Panel in the Seminar Room at 1 Park Square West

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Mr. S. L. Hignett (member of the Veterinary Panel), Mr. A. J. Shepperd (the new Chairman of The Wellcome Foundation Ltd.) and Mr. P. K. Brewin (Personnel Director of The Wellcome Foundation Ltd.) at the Trust's Exhibition, May 1975

Hopwood (Kenya, India and Boston). In addition, Dr. Williams and Dr. Hopwood attended the inauguration of the Naficy Building in the School of Public Health in Tehran, funds for which had been partially supplied by the Trust. Dr. Williams and Dr. Bembridge also visited Bulgaria at the invitation of the Bulgarian Ministry of Health with a view to arranging fellowship interchange.

During this period there were two opening ceremonies for laboratories provided by the Trust—first of Dental Research Laboratories and then a Department of Veterinary Anaesthesia, both at Bristol University.

The Trustees have made some changes in their organisational structure. They are about to appoint Panels to assist them in the assessment of their programmes for the support of Mental Health (Chairman: Professor W. S. Peart) and Tropical Medicine (Chairman: Dr. C. E. Gordon Smith). Professor R. H. S. Thompson has relinquished the Chairmanship of the Veterinary Panel which he has held since it was first formed, as he considered that it would be valuable if Sir Michael Swann could bring to bear on this subject his experience as Chairman of the Committee of Enquiry into the Veterinary Profession.

Visitors to the Trust have been numerous, but particularly we wish to report the visits of Mr. Ernest J. Hansen, Chairman of the Board of Trustees of the Wellcome Memorial in Garden City, Minnesota and Mr. William C. Blethen, the new Secretary of the Trustees at Garden City. It is with regret that we report the death of Mr. Arthur Ogle who had been Secretary to the Board since its formation. We extend our sympathy to his widow.

It is also sad to report the death of Mrs. "Tommy" Thomson who had for many years been secretary to Mr. J. E. K. Clarke, the first Secretary to the Wellcome Trustees.

Dr. Williams has been concerned during the past two years with activities in the general world of Charities. He has been a member of the National Council of Social Service Committee under the Chairmanship of Lord Goodman, which

has been examining the Effects of Charity Law and Practice on Voluntary Organisations. He has also been Chairman of a European and a British group examining the case for forming associations of Foundations to assist in monitoring changes in the legal, fiscal and political scene that may affect their activities.

Dr. Hanington has continued her research in Migraine and has been made a member of the Medical Advisory Council of the Migraine Trust.

Dr. Hopwood has developed his interest in the management of medical care in the Tropics and has produced a valuable teaching manual. His reputation in this field has led to considerable demands on his time for advice and to visit medical and other departments at home and overseas.

The activities of the Trust depend on the loyal and enthusiastic work of all the staff of the Trust. The Trustees would like to thank them for their efforts.

Acknowledgement

The Trustees would like to record their gratitude to the Panel members and many scientific advisers who have helped them in assessing the applications which have come before them for consideration.

Wellcome Trust Advisory Panels

History of Medicine

Professor A. R. Hall, M.A., Ph.D. (Chairman)
Professor C. C. Booth, M.D., F.R.C.P.
Professor A. G. Dickens, C.M.G., M.A., D.Litt., F.B.A., F.S.A.
Professor P. Mathias, M.A.
Professor Sir John McMichael, M.D., F.R.C.P., F.R.S.
Professor L. G. Stevenson, M.D., Ph.D.
Dr. E. S. Clarke, M.D., F.R.C.P. (Assessor)
Staff members responsible: Dr. P. O. Williams
Dr. B. A. Bembridge
Miss P. A. Bradburne

Veterinary Medicine

Professor R. H. S. Thompson, C.B.E., M.A., D.M., D.Sc., F.R.C.P., F.R.C.Path.,
F.R.S. (Chairman)
Professor E. Cotchin, D.Sc.
Mr. S. L. Hignett, B.Sc., F.R.C.V.S.
Professor D. L. Hughes, Ph.D., F.R.C.V.S.
Mr. P. D. Rossdale, M.A., F.R.C.V.S. (from January 1975)
Sir Michael Swann, F.R.S.
Professor G. M. Urquhart, Ph.D.
Staff members responsible: Dr. Edda Hanington
Mr. D. G. Metcalfe

ADVISORY PANELS APPOINTED FROM DECEMBER 1976:

Mental Health

Professor W. S. Peart, M.D., F.R.C.P., F.R.S. (Chairman)
Dr. D. E. Broadbent, C.B.E., Sc.D., F.R.S.
Professor D. Grahame-Smith, M.B., Ph.D., F.R.C.P.
Dr. L. L. Iversen, M.A., Ph.D.
Professor M. Shepherd, D.M., M.R.C.P., D.P.M.(Eng.)
Dr. D. C. Watt, B.Sc., M.D., D.P.M.(Eng.)
Staff members responsible: Dr. Edda Hanington
Mr. D. G. Metcalfe

Tropical Medicine

Dr. C. E. Gordon Smith, C.B., M.D., F.R.C.P., F.R.C.Path. (Chairman)
Professor S. Cohen, M.D., Ph.D., F.R.C.Path.
Dr. L. G. Goodwin, C.M.G., M.B., F.R.C.P., F.R.S.
Professor R. G. Hendrickse, M.D., F.R.C.P.(Edin.), F.R.C.P.(Lond.),
F.M.C.(Paed.)
Professor W. W. Macdonald, Ph.D., D.Sc., F.I.Biol.
Professor T. R. E. Southwood, D.Sc., Ph.D., A.R.C.S.
Dr. R. G. Whitehead, M.A., Ph.D., F.I.Biol.
Staff members responsible: Dr. B. E. C. Hopwood
Mrs. G. M. Breen

Appendix I

POLICY STATEMENT FOR 1975-76

In its last report the Wellcome Trust pointed out some of the difficulties that were facing the universities in their role as centres of medical research. The Vice-Chancellors and Deans of Universities with Medical Schools were written to and suggestions were made of ways in which the Trust might help to alleviate the difficulties.

Discussions have now been held with a number of these institutions and the Trustees have given further consideration to their policy.

There is no doubt that the universities are going to suffer from lack of opportunity to create and sustain new developments. With this in mind, they are seeking longer-term support from non-university sources although they are mostly unable to provide clear prospects for the future absorption of these projects.

Whatever the particular circumstances, it is apparent that medical schools can only undertake new developments if they are prepared to make arrangements to re-deploy their funds. This will entail a degree of organisation and forward planning for the future that is not normally undertaken. The Trustees regard such forward planning as an essential requirement if long-term support is to be provided by the Trust. They will therefore ask that those institutions that seek long-term support shall demonstrate that they have done the necessary forward planning.

The Trustees envisage their future support for research as falling into the following categories:

- 1) The support in whatever way seems most appropriate of individuals of outstanding quality with programmes of particular interest.
- 2) The provision of longer-term support for projects of high quality of an interdisciplinary or uni-disciplinary

nature on condition that such developments can be identified by the Institution as part of its future plans for which it envisages providing funds by re-deployment.

- 3) The support of subject areas identified by the Trustees as worthy of special attention either because of their neglect or because some special type of support would accelerate their development.
- 4) The provision of short-term grants for up to three years for projects that have a natural termination—no undertaking for the future of such projects will be asked of the Institution.

The Trustees recognise that a real danger in the present situation is the apprehension of young able graduates that they will be unable to have a progressive career if they enter and stay in full-time medical research. They therefore decided that research assistants and others employed on grants shall be allowed to spend some time on teaching and other duties so as to equip themselves for university posts at the end of a grant. The time thus released for senior staff might be beneficial to the whole programme.

Other schemes previously announced by the Trust will be continued. These include:

- 1) The research leave scheme proposed by the Trust to enable university staff to be relieved from their teaching and administrative duties so that they can spend periods in full-time research.
- 2) A scheme for joint appointments partly financed by the Trust and partly by the university and aimed at giving the universities an opportunity to maintain their research strength.
- 3) A scheme for the proleptic appointment of staff to vacancies that will arise through retirement. The period to be used for research.

The Trustees also decided :

- 1) To continue the scheme of Senior Research Fellowships in Clinical Science and fellowships in Surgery.
- 2) To develop their interest in Mental Health and Neurology.
- 3) To give continued support to Dermatology in those centres of quality that they have identified. They will also continue with their programmes for Tropical Medicine and Veterinary Medicine.
- 4) To continue their programme for the History of Medicine by supporting the Wellcome Institute for the History of Medicine, the Wellcome Units in universities and by providing grants.

The Trustees estimate that they will be able to allocate £4m. during 1975–76 for these programmes.

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