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Public Health Laboratory Service



1966 YEAR BOOK

including Annual Report for 1965

[1966]

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THE PUBLIC HEALTH LABORATORY SERVICE BOARD

During 1965 two new members of the Board were appointed—in succession to Dr. P. Alwyn-Smith, whose term of membership came to an end on 31st July, and to Dr. D. Thomson, who vacated his appointment as a Deputy Chief Medical Officer, Ministry of Health, in order to take up the post of Treasury Medical Advisor. The two new members are Dr. A. A. Driver, Senior Administrative Medical Officer, Leeds Regional Hospital Board, and Dr. R. M. Shaw, a Deputy Chief Medical Officer, Ministry of Health.

THE PUBLIC HEALTH LABORATORY SERVICE
BOARD
(1966)

Chairman: E. T. C. Spooner, M.D., F.R.C.P.

(Dean, London School of Hygiene and Tropical Medicine,
London, W.C.1)

Members: A. H. Clough, C.M.G., O.B.E.

(late Under Secretary, H.M. Treasury)

Professor A. C. Cunliffe, M.D., F.C.Path.

(Professor of Bacteriology, University of London, at King's
College Hospital Medical School, London, S.E.5)

Professor A. W. Downie, M.D., D.Sc., F.C.Path., F.R.S.

(Professor of Bacteriology, University of Liverpool)

A. A. Driver, M.D., D.P.H.

(Senior Administrative Medical Officer, Leeds Regional
Hospital Board)

J. Stevenson Logan, M.B., Ch.B., D.P.H.

(Medical Officer of Health, Southend-on-Sea, Essex)

J. R. McGregor, C.B., C.B.E., M.C.

(late Director of Finance, War Office)

R. M. Shaw, M.B., D.P.H.

(Deputy Chief Medical Officer, Ministry of Health)

Charles C. Stevens, LL.B.

(Member of Manchester Regional Hospital Board; Chairman,
Macclesfield and District Hospital Management Committee)

Professor C. H. Stuart-Harris, C.B.E., M.D., F.R.C.P.

(Professor of Medicine, University of Sheffield)

J. F. Warin, M.D., D.P.H.

(Medical Officer of Health, Oxford)

G. I. Watson, M.D., D.T.M. & H.

(Medical Practitioner, Peaslake, Surrey)

Professor R. E. O. Williams, M.D., B.Sc., F.C.Path.

(Professor of Bacteriology, University of London, at the
Wright-Fleming Institute, St. Mary's Hospital, London, W.2)

Staff Assessors to the Board:

B. Moore, M.D., B.Sc., F.C.Path., B.A.O.

Mrs. J. Taylor, M.B., B.Sc., F.C.Path., D.P.H.

Secretary:

D. V. T. Fairrie, B.A., F.C.A.

- Professor A. C. Girdle, M.D., F.R.C.P.
Department of Pathology, University of London at King's
College Hospital Medical School, London, W.5
- Professor A. W. Foster, M.D., D.Sc., F.R.C.P.
Department of Pathology, University of London
A. E. Jones, M.D., D.P.H.
- Senior Administrative Medical Officer, Royal
Hospital (Hamp)
- A. Stevenson Taylor, M.D., D.P.H.
Medical Officer of Health, Southend-on-Sea, Essex
- A. W. Anderson, C.B., D.P.H., M.C.
Joint Director of Public Health, The Gambia
- R. E. Shaw, M.D., D.P.H.
Deputy Chief Medical Officer, Ministry of Health
- Charles C. Bennett, LL.B.
Director of Medical Research, Regional Hospital, Bristol
- Medical Officer and District Hospital Management Committee
Professor C. H. Stuart-Harris, F.R.C., M.D., F.R.S.
Department of Medicine, University of Sheffield
- A. W. White, M.D., D.P.H.
Medical Officer of Health, Bristol
- G. I. Wilson, M.D., D.P.H., M.R.C.P.
District Physician, Tisbury, Wiltshire
- Professor R. G. Williams, M.D., M.R.C.P.
Department of Pathology, University of London at St.
Bartholomew's Hospital, St. Bartholomew's Hospital, London, E.C.4
- Chief, Laboratory in the District
R. Jones, M.D., M.R.C.P., F.R.C.P., B.S.A.
The A. Taylor, M.D., M.R.C.P., F.R.C.P., D.P.H.
- Secretary:
R. V. T. Lewis, M.A., F.C.A.

INTRODUCTION

ADMINISTRATION AND ORGANISATION OF THE SERVICE

The Public Health Laboratory Service is the successor of the Emergency Public Health Laboratory Service planned, organised and administered during the war years 1939 – 1945 by the Medical Research Council, at the request of H.M. Government. In 1945 it was decided by the Government to retain the Service on a permanent footing. Statutory authority was provided by Section 17 of the National Health Service Act, 1946, which empowered the Minister of Health to provide a "bacteriological service" for the control of the spread of infectious diseases. Later the Medical Research Council agreed to an extension of the period of their administration, with the delegation of detailed responsibility to the Public Health Laboratory Service Board appointed by them for this purpose. In 1960, however, the Public Health Laboratory Service Act, 1960, established and incorporated a new Public Health Laboratory Service Board as a statutory body capable of acting in its own right as agent for the Minister. The Act also provided for the transfer of staff of the Service from the employment of the Council to that of the Board, and the transfer of property from the Council to the Minister of Health; these transfers took effect on 1st August, 1961.

The Chairman and members of the Public Health Laboratory Service Board are appointed by the Minister of Health and, in accordance with the Schedule to the Act, the members must include the following (and must therefore be at least eight in number, in addition to the Chairman):

- (a) not less than two persons appointed after consultation with the Medical Research Council;
- (b) not less than two persons with experience as bacteriologists, appointed after consultation with such organisations as the Minister thinks appropriate;
- (c) not less than two persons holding office as medical officer of health to a local authority;
- (d) not less than one person appointed after consultation with such organisations as appear to the Minister to represent the hospital service;
- (e) not less than one fully registered medical practitioner engaged in general medical practice, appointed after consultation with such organisations as the Minister may recognise as representative of practitioners so engaged.

The Chairman and members of the Board are normally appointed for a term of three years.

The Board exercises its functions in accordance with any directions received from the Minister of Health. In the exercise of these functions it acts as a principal.

The staff of the laboratories of the Service are appointed and employed by the Board. The scientific staff are selected almost entirely from newly qualified medical graduates after they have held house appointments for 6 to 12 months; they then receive 5 years' training in pathology and bacteriology. During the third year the trainee is required to obtain the Diploma in Bacteriology of the University of London or the University of Manchester. As a general rule, science graduates without medical qualifications are employed only in the reference laboratories, where the work is of a highly specialised nature. The technical staff is recruited from boys and girls leaving school at 16 to 17 years of age, who have reached the necessary standard of education; they go through a 5-year apprentice system of training.

The development of the Service between 1948 – in which year it was established in its present form – and 1964 may be summarised as follows:

	1948	1955	1962	1965
Number of Constituent				
Laboratories	36	56	59	61
Medical staff	84	{ 124	132	134
Scientific staff			39	46
Technical, Clerical and Maintenance staff	562	778	956	1,044
Total specimens examined	793,314	1,689,033	2,314,126	2,894,336

At first the material received at the laboratories consisted of sanitary specimens – milks, water, foodstuffs, etc. – and specimens of human and animal origin sent in for bacteriological examination. In 1956, however, after a field trial of the Salk poliomyelitis vaccine carried out with the help of the laboratories of the Service under the aegis of the Medical Research Council, attention was increasingly directed to the examination of specimens for virus infection. By 1958 the majority of the laboratories were able to offer the virus diagnostic service which is now general. In 1965, 72,009 virus specimens were examined.

In the early post-war years most of the constituent laboratories were housed in temporary accommodation provided by County Councils, County Borough Councils, University departments and hospitals; a few were in huts or converted houses. However, a programme was soon established for the provision of permanent buildings, designed for their purpose, and sited conveniently for the areas served. It was decided by the Ministry of Health in 1946 that, whenever possible, public health laboratories should in future be situated in hospital compounds, as the need for the integration in the Service of public health and hospital bacteriology became generally recognised. After the Regional Hospital Boards had come into operation, this led to the establishment of the joint public health and hospital laboratories, which have subsequently become a developing feature of the organisation of the Service. At the present time nearly all major projects for new buildings are of this nature, and the building programme is linked to that of the Ministry of Health for new hospitals.

The Central Laboratory of the Service is situated at Colindale, London, N.W.9, and contains a number of reference and specialist departments, including a diagnostic laboratory which, in addition to acting as a laboratory of "first reference" for bacteriological and virological specimens, receives routine work from the adjacent area of Middlesex. There are three small affiliated laboratories at Coppett's Wood, Edmonton and Neasden receiving routine public health work from their areas.

There are 61 constituent laboratories in England and Wales, together with 3 "recognised" ones (see page 28) — these latter being hospital pathological laboratories which undertake the examination of sanitary specimens for the Service in areas where facilities of a constituent laboratory are not available; or are available only at a long distance with considerable inconvenience. In addition, a small number of consultant bacteriologists employed by Regional Hospital Boards in the Hospital Service are associated on a part-time basis with the Public Health Laboratory Service (see page 28).

The total of 61 constituent laboratories includes the following 9 regional ones: Bristol, Cambridge, Cardiff, Leeds, Liverpool, Manchester, Newcastle upon Tyne, Oxford and Sheffield. These regional laboratories, most of which are staffed by three to five medically qualified workers, together with junior bacteriologists in course of training, act to some extent as parent laboratories to a group of area laboratories. Help is provided in the handling of special—e.g. epidemiological—enquiries, and in the provision of staff substitutes during periods of leave or illness.

SCOPE OF THE SERVICE

The routine work of the Service is essentially bacteriological, virological and epidemiological. Apart from certain tests closely associated with bacteriological and virological investigations, chemical and biochemical tests and histological examinations are not performed. Except by special arrangement the Service does not undertake work that is rightly within the province of the hospital or clinical pathologist, but it is ready to offer help when facilities for such work are not otherwise available.

All specimens must be submitted by doctors, veterinarians, dentists, public health inspectors, and others acting on behalf of medical officers of health, Government departments, or representatives of other official bodies; specimens cannot be accepted from private persons (see, however, subparagraph (b) below).

The routine specimens fall under two main heads:

- (a) "Medical" specimens received from medical practitioners, infectious diseases hospitals and local authorities. These are specimens of sputum, faeces, throat swabs, blood samples, etc., taken for diagnostic examination from persons suspected of suffering from infectious disease. General practitioners, medical officers of health, school medical officers and others are offered a comprehensive service for the diagnosis, treatment and prevention of bacterial, virological and mycological infections. Medical

practitioners are welcomed at all times in the laboratories for the purpose of consultation.

- (b) "Sanitary" specimens: these are received from medical officers of health, public health inspectors, and others concerned officially with the control of the public health. They comprise specimens for bacteriological examination of water, shell-fish, watercress, sewage, milk and cream; of processed foods such as ice-cream, artificial cream and canned foods; and of imported products such as the various forms of meat, fish, processed egg, coconut and fertiliser. The Service normally examines only material offered to the consumer, but will, of course, examine specimens taken at any stage of production or distribution by medical officers of health investigating suspected food-borne infections. The Service is ready to give free advice to food manufacturers and processors to assist them in the production and distribution of bacteriologically safe products. For routine control of such products, commercial firms are charged a fee, but work of this sort is undertaken only exceptionally.

Brief mention has already been made of the reference laboratories and specialist departments. These provide facilities for the exact identification and "finger-printing" of organisms belonging to many different groups. This is sometimes required by clinicians in their treatment of patients, but more often for epidemiological purposes. The reference laboratories are open freely for use by any laboratory within or without the Service. In addition, a number of reference experts are retained for the examination of occasional specimens which require special skill, special knowledge, or special reagents.

The epidemiological work of the Service includes not only the investigation of outbreaks of infectious disease, in co-operation with local medical officers of health, but also studies of the distribution and behaviour of infectious agents throughout England and Wales, and of the various aspects of the immunisation programme. Epidemiological information is collected centrally week by week from public health and hospital laboratories all over the country, including Scotland, Northern Ireland and Eire and then made available to each of these laboratories in return in the form of a confidential weekly summary.

Field investigations of infectious disease, and field trials of protective agents, including vaccines, are frequently carried out. All laboratories are engaged to some extent in research in addition to routine work.

A special feature of the Service is the investigation of various problems by Working Parties containing a dozen or more members drawn from laboratories in different parts of the country. Some of the problems investigated are of direct concern to Government Departments, with which close working relations have always existed.

In addition to normal public health work, an increasing number of laboratories of the Service are undertaking responsibility for clinical bacteriology at hospitals. Arrangements of this kind, involving the association of a public health laboratory with the pathological laboratory of a hospital,

provide many advantages, and are frequently requested by hospital authorities. They are readily accepted on condition that there is also a need for public health laboratory facilities in the area.

General information about the current work of the Service, together with contributions from other workers in related fields, is published in the joint "Monthly Bulletin of the Ministry of Health and the Public Health Laboratory Service" which is issued, free of charge, to all medical officers and Bacteriologists concerned with epidemiology and public health. The section of this publication which is concerned with the activities of the Service is edited by Dr. J.C. Kelsey of the Central Public Health Laboratory, Colindale Avenue, London, N.W.9. For those who do not receive a free copy, the Monthly Bulletin may be purchased at 1s. 6d. a copy through the Ministry of Health.

The Service distributes various vaccines and sera on behalf of the Ministry of Health. It also provides certain reagents for diagnostic purposes, prepared by or issued from the Standards Laboratory for Serological Reagents at the Central Public Health Laboratory, Colindale Avenue, London, N.W.9 (see page 27).

GRANTS AND OTHER ASSISTANCE RECEIVED FOR SPECIAL INVESTIGATIONS

The Public Health Laboratory Service Board now receive valuable assistance from the Departmental Research and Development Fund of the Ministry of Health. Allocations from this fund have enabled the Board to undertake the following important projects, involving research work of an 'operational' nature:

A study of the use of a computer for the identification of bacteria.

The establishment of a special laboratory for the study and typing of mycoplasmas—this being a necessary preliminary step towards the provision by the Service of reference facilities for these organisms.

The purchase of an auto-analyser for experimental work on the use of this apparatus in the field of bacteriology.

The Board also receive grants from the following bodies for the assistance of special investigations and the acquisition of major equipment of a special nature:

(a) From the World Health Organisation:

\$3,500 for the assistance of laboratory research on enteric phage-typing at the International Centre recognised at the Enteric Reference Laboratory, Colindale, London.

\$3,500 for the International Shigella Centre recognised at the Dysentery Reference Laboratory, Colindale, London.

\$3,000 for the International Reference Centre for Staphylococcal Phage-typing recognised at the Cross-Infection Reference Laboratory, Colindale, London.

\$4,000 towards the cost of testing the specificity of virus antisera at the Standards Laboratory for Serological Reagents, Colindale, London.

\$2,500 for the preparation and testing of reagents (rhinovirus), at the Virus Reference Laboratory, Colindale, London.

\$3,500 towards the cost of epidemiological serological investigations of tropical sera for antibodies in treponematoses at the Venereal Diseases Reference Laboratory, London Hospital Research Laboratories, London.

(b) From the Medical Research Council :

A grant of £11,698 a year for two years for a second survey into the pattern of infection in acute respiratory virus diseases, £3,370 a year being for a study in collaboration with general practitioners and £8,328 a year for a study in association with the Council of children in hospital.

Grants have been received by the following individual members of the Board's staff:

(a) From the Medical Research Council :

Dr. L. Hoyle (Director, Public Health Laboratory, Northampton).

Further provision for the expenses of an investigation of the physical and chemical structure of influenza virus.

Provision for scientific assistance for research into chemical reactions of myxovirus proteins.

Dr. I. G. Murray (Director, Mycological Reference Laboratory, London School of Hygiene and Tropical Medicine).

Provision for research in serological methods in the classification of pathogenic fungi and in the diagnosis of mycoses.

Dr. T. M. Pollock (Director, Epidemiological Research Laboratory, Colindale, London).

Further provision for an investigation to evaluate gamma globulin in prevention of congenital malformations due to rubella and undefined infections in early pregnancy.

In addition to the provision of research grants described above, two research projects are in progress jointly with the Medical Research Council, in which members of the Council's scientific staff are collaborating. These are as follows:

Research work on viruses at the Epidemiological Research Unit, Cirencester, Gloucestershire;

Various studies at the Cross-Infection Reference Laboratory, Colindale Avenue, London, N.W.9.

Laboratory Directors of the Service are also carrying out investigations in conjunction with general practitioners and hospital medical officers, in many places, notably in the study of chronic bronchitis, of hospital cross-infection and of sterilisation and disinfection problems; on gastro-enteritis and the safety of various foods.

is added to the list of the most important of the world's great rivers, the Amazon, which is the largest of the world's great rivers. It is the only one of the great rivers of the world which is not a tributary of the Atlantic Ocean.

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REVIEW BY THE DIRECTOR OF THE SERVICE OF ACTIVITIES IN 1965

LABORATORIES

In 1965, no new laboratories were opened; but approval was given to setting up a joint laboratory at St. George's Hospital, Tooting Grove, and of a Mycoplasma Reference Laboratory at Colindale.

Progress was made with planning the scheme for the removal of the Area Public Health Laboratory, Birmingham from the existing premises to the Little Bromwich Wing of the East Birmingham Hospital, for the association of the Laboratory with the Hospital, and for its up-grading to Regional status.

The Area Public Health Laboratory, Derby became associated with the Derbyshire Royal Infirmary.

Major building schemes are in progress at Birmingham, Bristol, Cardiff, Exeter, Hull, Liverpool, Nottingham, Peterborough, and Poole.

On 6th August 1965, the Minister of Health, The Rt. Hon. Kenneth Robinson, P.C., M.P., accompanied by Dr. Daniel Thomson, C.B., Deputy Chief Medical Officer of the Ministry of Health, paid a visit to Colindale, inspected the laboratories, and talked to members of the staff.

The Research and Development Fund of the Ministry of Health supported the early (research) stage of three new projects of a kind that may be expected to lead to a development of the Service: (1) Bacterial Identification by Computer; (2) Mycoplasma Reference Laboratory; and (3) Possible use of the Autoanalyser in Routine Serology.

At the request of Professor P. N. Meenan, Department of Medical Microbiology, University College, Dublin, arrangements were made – similar to those now operated with Scotland and Northern Ireland – for Professor Meenan's attendance at meetings of the Staff Committee and for regular exchanges of information through the medium of the Weekly Summary.

Further useful and welcome exchanges with Scotland have been made through reciprocal arrangements for membership of various Working Parties and Committees.

There has been a further transfer of the large-scale manufacture of reagents, hitherto made at the Standards Laboratory, to Burroughs Wellcome Limited.

STAFF

Retirements and Resignations.

Dr. B. R. Sandiford, Director at Birmingham since 1947 (Laboratory taken over from City in 1950) retired on 18th June.

Professor D. T. Robinson, Director at Liverpool since 1943 (Laboratory taken over from City in 1955) retired on 31st July.

Dr. J. L. G. Iredale, Director at Derby since 1938 (Laboratory taken over from City in 1958) retired on 31st October.

Dr. R. L. Vollum, part-time Director at Oxford since 1949 retired on 13th November.

Miss H. E. Ross, Scientist at National Collection of Type Cultures since 1949, retired on 31st March.

Dr. D. Taylor-Robinson left to take up an appointment with the Medical Research Council.

Dr. F. A. J. Bridgwater was appointed Consultant Bacteriologist, East Birmingham Hospital.

Dr. L. A. Hatch left the Service to take up a post in Canada as Medical Consultant in the Virus Laboratories of the Department of National Health and Welfare at Ottawa.

Dr. A. J. Zuckerman was appointed Senior Lecturer at the London School of Hygiene.

Appointments

Dr. J. G. P. Hutchison was appointed to succeed Dr. Sandiford as Director of the Birmingham Laboratory.

Dr. B. W. Barton was appointed to succeed Dr. Iredale as Director of the Derby Laboratory (now associated with the Derbyshire Royal Infirmary).

Dr. W. H. H. Jebb was appointed to succeed Dr. Vollum as whole-time Director of the Oxford Laboratory. This is a joint appointment with the United Oxford Hospitals.

Dr. Margeurite S. Pereira, was appointed Deputy Director of the Virus Reference Laboratory, at Colindale.

Mr. L. R. Hill was appointed Deputy Curator of the National Collection of Type Cultures.

Locums

We are most grateful to the following for help with locum duties:- Dr. R. Norton at Birmingham; Dr. D. Riding at Chester and other places; Dr. E. Rossier (from Switzerland) at Maidstone; Dr. D. H. Fulton at Peterborough, and Dr. Herta Schwabacher at Watford.

New Secondments Abroad

Dr. D. C. J. Bassett has been seconded to the Trinidad Regional Virus Laboratory for a two-three year period.

Dr. D. L. Miller received a Public Health Fellowship of U.S. Department of Health, Education and Welfare for one year.

Visits Abroad

Mr. J. D. Atkinson, Senior Technical Officer, Colindale, visited the United States and Canada to examine and investigate laboratory equipment, and to

study design features of laboratories. Dr. J. O'H. Tobin accompanied the Chief Medical Officer of the Ministry of Health on a visit to Yugoslavia to advise the Government on the organisation of scientific research in medicine; Dr. Tobin acted as adviser in virology. Dr. M. T. Parker was invited by the Microbiological Committee of the Polish Academy of Sciences to read a paper at a Symposium on Staphylococci and Staphylococcal Infections in Warsaw; and he read a paper at the Fifth Colloquium on questions of phage-typing in Wernigerode in East Germany. At the invitation of the Royal Swedish Academy of Engineering Sciences, Dr. J. C. Kelsey visited Stockholm to lecture on the use of radiation for sterilising medical equipment and instruments. Dr. I. G. Murray was invited by Professor Vanbreuseghem to Antwerp to give a lecture to the Mycology School of the Institut de Medecine Tropicale Prince Leopold. Dr. Betty C. Hobbs attended a meeting of the Food and Agriculture Organisation of the United Nations and International Atomic Energy Agency. Dr. A. D. Macrae visited public health virus laboratories in the United States of America for discussion on virus surveillance and diagnostic programmes, by invitation of W.H.O. Fellowship Selection Committee. Dr. S. T. Cowan went to Prague and Brno to visit public health laboratories there and to lecture to the Czechoslovakian Microbiological Society, by invitation of the National Academy of Sciences. Dr. C. M. Patricia Bradstreet accepted an invitation from W.H.O. to attend a meeting of W.H.O. Respiratory Virus and Enterovirus Reference Centres. Dr. L. H. Turner attended a colloquium on leptospirosis and a meeting of the W.H.O. Scientific Group on Research in Leptospirosis in Antwerp. Dr. E. S. Anderson went to Dieppe for discussions with Dr. Pierre Nicholle of the Pasteur Institute in connection with the International Committee Meeting on Enteric Phage-Typing to be held in Moscow in July 1966. Dr. Margeurite S.T. Pereira attended the Third Meeting of the European Tumour Virus Group in Israel.

Visiting Workers

Many visitors spent periods at the laboratories at Colindale, Cambridge, Guildford, Leeds, Liverpool, Manchester, Middlesbrough, Swansea, Wakefield, the Epidemiology Unit at Cirencester, the Leptospirosis Reference Laboratory and the V.D. Reference Laboratory. Dr. L. Hana from Czechoslovakia is working at the Public Health Laboratory, Northampton on research into chemical reactions of myxovirus proteins.

An Epidemiology Course for holders of W.H.O. Fellowships was held again at Colindale in February and March.

The Colindale Directors in conjunction with the London School of Hygiene gave a Course on the Identification of the Enterobacteriaceae at the London School of Hygiene in August.

SCIENTIFIC WORK

Fifty Years of the Standards Laboratory

On June 24th 1965 a gathering was held at the Central Public Health Laboratory, Colindale, to celebrate the founding of the Standards Laboratory

for Serological Reagents by Professor Dreyer fifty years ago. It was a pleasure to welcome two former directors of the Laboratory, Professor A.D. Gardner and Lt. Col. H. J. Bensted. The absence of Miss Edith Stubington, who died early in 1965, was much regretted. She had joined Professor Gardner in the early days at Oxford, came on to Colindale, and remained in the department until 1948.

Soon after it was established by Professor Georges Dreyer, the Standards Laboratory was handed over to Professor Gardner who continued the early work of setting up standards for the preparation of bacterial reagents for use in the diagnosis of infectious disease. He directed it for the next twenty-five years. After the incorporation of the Laboratory into the Public Health Laboratory Service and its removal to Colindale, Lt. Col. Bensted was in charge of the Laboratory from 1945 until his retirement in 1956. There was a rapid expansion of bacterial work during the war years 1939-1945 (when the Laboratory was under the direction of Col. R. F. Bridges). With the continued recognition of new organisms more exacting techniques were developed to produce a wider range of reliable typing antisera. These were the main activities of the Laboratory until 1956.

Dr. Patricia Bradstreet, who has been directing the Laboratory since 1956, described developments in recent years.

The year of a jubilee was perhaps an appropriate occasion to make the decision to shed much of the work of preparation and supply of well-tried bacterial reagents to a commercial firm. The production of a wide range of viral antigens and antisera has been an important preoccupation for several years. Our hope is that it may now be possible to pursue these endeavours more thoroughly, to experiment with a range of new bacterial reagents, and to take up the study of some of the many new techniques which are being introduced into the fields of diagnostic immunology.

Transferable drug resistance in the Enterobacteriaceae

Drug resistance in bacteria declared itself within a short time of the introduction of the sulphonamides, and the early work on penicillin resistance in staphylococci by the late Mary Barber sounded a warning note on the uncritical use of antibiotics. The discovery of transferable drug resistance in the Enterobacteriaceae by the Japanese opened a new field of investigation in bacterial genetics, and disclosed a problem of potentially major importance in the use of antibiotics in the treatment of infections with these organisms. Transferable drug resistance depends on the presence of genetic fragments (resistance determinants or R-determinants) endowing the strains carrying them with resistance to one or more antibiotics or synthetic antibacterial drugs, and on resistance transfer factors (RTF'S), which are attached to the R-determinants and which confer mobility on the complex. The RTF-R-determinant complexes are designated resistance factors (R-factors), and are transmitted between bacteria by conjugation. These R-factors show remarkable catholicity in the bacteria they will 'infect'; for example, they have been transferred to *Escherichia coli*, *Salmonella*, *Serratia*, *Shigella*, *Proteus*, *Pasteurella*, and *Vibrio*.

Drug resistance has become a serious problem in the salmonellae, particularly in *S. typhimurium*, and attention has been concentrated on it for some time in the Enteric Reference Laboratory, where the large-scale phage-typing of *S. typhimurium* has been carried out for many years. The problem is most acute in animal husbandry, especially in calf rearing, and it has been suggested (Anderson & Lewis, 1965a & b) that this is due to two factors: poor conditions of animal management in intensive farming, and in the transport and marketing of animals on the one hand; and the widespread use of antibiotics and synthetic antibacterial drugs on the other. The first factor facilitates the spread of infection in calves, a spread aided by the distribution of infected stock by dealers. The second ensures the emergence of drug-resistant strains of *S. typhimurium*. It has been shown that most of these resistant strains will transfer their resistance to *E. coli*. The extent of the resistance may vary, from one drug—for example, tetracycline, to many drugs—for example, ampicillin, chloramphenicol, furazolidone, kanamycin, neomycin, streptomycin, sulphonamides, and tetracycline. Special studies have been carried out in phage-type 29 of *S. typhimurium*, which is now the commonest type in cattle and which has caused many human infections, almost certainly of bovine origin (Anderson, 1965; Anderson & Lewis, 1965a & b).

It had been suggested by other workers that the R-determinants formed a linkage group into which the RTF was integrated. The work in the Enteric Reference Laboratory suggests that a more acceptable hypothesis is that the R-determinants for individual drugs are independent of each other and are independently attached to the RTF. The RTF-R-determinant complexes are dissociable, and some R-factors are transferred with relatively low frequency because the majority of cells contain the complex in the dissociated state. Such cells transmit the RTF only. The RTF's are highly communicable and may infect most cells of a recipient culture after overnight contact with RTF donor strains. The RTF may be lost during the transmission of an R-factor to a recipient cell. The resulting line acquires the resistance corresponding to the R-determinant, but cannot transmit it by conjugation. Superficially, it is indistinguishable from a drug-resistant mutant. Infection of such a strain with the RTF results in reconstruction of the RTF-R-determinant complex, that is, the R-factor, and the drug resistance then becomes transferable.

Although the existence of the RTF's was postulated some years ago, they were first demonstrated as separate entities in the Enteric Reference Laboratory. Their properties may be summarized as follows: they are transferred by conjugation between donor and recipient strains; certain of them will cause specific changes of phage-type in *Salmonella typhimurium* and other salmonellae; and they will mobilize genetic determinants for drug resistance, colicinogeny, and probably other characters.

It has been established that transfer factors are common in wild drug-sensitive strains of *S. typhimurium*. In particular, they predominate in cultures of phage-type 29 of *S. typhimurium* isolated before drug resistance became a problem in that type, and before the type itself became a problem in calf infection. When a wild drug-sensitive strain carrying a transfer

factor is crossed with a wild drug-resistant strain unable to transfer its resistance, the transfer factor mobilizes the R-determinant which is then transferred into the strain which originally supplied the transfer factor. Thus, both donor and recipient strains finally possess the same transferable drug resistance factor.

These findings suggest the processes by which transferable resistance factors are formed and spread in the Enterobacteriaceae in nature. Strains of Enterobacteriaceae possessing non-transferring R-determinants are selectively enhanced in the animal intestine by the presence of the drugs corresponding to their resistances. The intrusion of a strain carrying a transfer factor into such a population will result in the formation of the corresponding R-factors which will spread, not only in the strains in which they are formed, but also into other strains, including that which initially supplied the transfer factor.

The characterization of transfer factors and R-determinants, and the clarification of their *modus operandi*, have given information about the ways in which drug-resistance has arisen and increased in Enterobacteriaceae under natural conditions. As far as livestock are concerned, the control of this increase and the limitation of the spread of resistant strains can result only from the adoption of a more prudent policy in the use of antibiotics in animal husbandry, and from improvement in the conditions of animal management.

Anderson, E. S. (1965). *Brit. med. J.* 2, 1289

Anderson, E. S. & Lewis, M. J. (1965a). *Nature*, 207, 579

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Watercress

The Working Party on Watercress produced its report and was dissolved. Epidemiological evidence showed that watercress has never been proved to be a vehicle of infection and suspicion of its being so was strong on only one occasion. Human fascioliasis appeared to be a greater risk than transference of salmonella organisms or viruses. Survey of 25 growing sites among 8 counties in England showed that, in terms of acreage, 73 per cent was produced under good and only 3 per cent under bad hygienic conditions.

No reliable bacteriological test of fitness of watercress for human use was found. Water supplies to watercress beds were sometimes of potable standard when obtained from a spring or bore. Surface waters, including river water, almost invariably contained coliform organisms in large numbers as also did water in the beds, even when the supply was free from these organisms. A standard based on numbers of coliform organisms in the water could therefore be misleading; none is suggested. Use of hypochlorite at a concentration of less than 50 ppm during or after packing reduces the number of organisms on watercress and is a useful practice.

It is proposed that when new watercress beds are constructed in future, river water and other surface waters likely to be polluted should not be used

and water supplies should be enclosed to prevent contamination. A Code of Practice for growers would be a valuable guide to structural improvements and hygienic measures, including those to reduce the risk of transmission of liver fluke.

Streptococcal Infection in Trinidad

Some five hundred cases of acute glomerulonephritis were admitted to hospital in Trinidad between September 1964 and April 1965. Dr. M. T. Parker from the Central Public Health Laboratory visited the island in May 1965 with a grant from the Medical Research Council to give advice on laboratory methods for the isolation and identification of haemolytic streptococci and on the need for outside assistance in research on the epidemiology and control of the disease. Workers from the North-Western University, Chicago were investigating the problem in Trinidad at the time, and ways of collaborating with them were explored. The Ministry of Overseas Development and the Medical Research Council have now provided some financial assistance for a programme of research, and the Public Health Laboratory Service has agreed that Dr. D. C. J. Bassett, who had been seconded to the Trinidad Regional Virus Laboratory, should devote part of his time to the investigation. Work began in October 1965, and is being carried out jointly by Dr. J. D. Arneaud (Senior Pathologist, Trinidad), Dr. L. Spence (Director, Trinidad Regional Virus Laboratory, University of the West Indies), and Dr. Bassett. The Streptococcus Reference Laboratory at Colindale is providing advice and typing facilities.

Acute glomerulonephritis appears to be only one of the manifestations of streptococcal infection in Trinidad, and acute rheumatism is also common. Group-A streptococci can be isolated from skin sores in nearly all of the cases of nephritis. About 20 per cent of school children have skin sepsis, and group-A haemolytic streptococci can be isolated from half of the sores. The first objectives of the investigation are to find out which of the streptococcal types found in the skin lesions are associated with nephritis, to study the method of spread of skin infections in village children, and to define the part played by haemolytic streptococci in other diseases (e.g. tonsillitis and rheumatic fever) in the same population.

Bacterial Identification by Computer

Bacterial identification depends on the prior classification of the bacteria concerned. The more precise the classification the more exact the identification. The number of bacterial species whose characters have been adequately described is now so large that identification is unmanageable with the aid of the human memory alone. It seemed possible, as suggested by Dr. L. C. Payne, that a computer might be used for bacterial identification.

A sub-committee was formed at the Central Public Health Laboratory, Colindale to plan an investigation along these lines. It was decided to restrict the experiment to Gram-negative rod-shaped bacteria which grow on nutrient agar and to prepare a table showing the behaviour of some 60 types

of such bacteria in a large number of tests. Each square of the table would be occupied by the probability that a particular type of bacterium would give a positive reaction in one test.

The reactions of an unknown strain in a selection of the tests are compared with the probabilities shown in the table, and the groups of organisms in the table are ranked in order of the relative likelihood that the unknown organism belongs to each. An arbitrary number of these groups are then chosen, for example those with about 50% probability or the best 10. The remaining tests are then arranged in the order of their power of discrimination between these selected groups, using a mathematical method to determine their discriminating power.

Progress has so far been made in the preparation of a matrix and programme for use with an ICT computer.

62 groups of organisms (not necessarily of the same taxonomic level, e.g. *Escherichia*, *Actinobacillus lignieresii*, *Bordetella parapertussis*, *Moraxella* species) were chosen to include most of the Gram-negative rods known to medical bacteriologists. Their reactions were established from the literature, from records in the Central Public Health Laboratory and in some cases by experimental work. Fifty-two tests were chosen which might be expected to give similar results in different laboratories, even if there were small differences in the media used. Tests which are difficult to reproduce were not used.

A matrix has now been completed in the form of a probability of any of the 62 organisms giving a positive result in any of the 52 tests. This matrix has been taken as a working basis but it is intended to review the figures in it when we have enough 'wild' strains to enable us to assess any group in the matrix.

Programmes are required both for the determination of the most probable organisms and for the selection of the next best tests. Several have been compared but none is yet satisfactory. Work on the mathematical aspect of the project is in progress.

Strains of the groups of organisms represented in the table have been collected and tested in all 52 tests chosen for use in trials in the early stage of the project. As soon as a programme has been devised which appears to give satisfactory results, it is hoped to extend the project to a limited number of other P.H.L.S. laboratories.

The aim of the project is to work out a method by which a computer is used to assess the results of a limited number of primary tests and to recommend which are the best tests for the bacteriologist to perform next.

Mycoplasma Reference Laboratory

Mycoplasmas comprise the group which includes the pleuropneumonia and pleuropneumonia-like organisms (P.P.L.O.). Some of these organisms are regarded as specific pathogens associated particularly with respiratory disease in animals, birds, and man. Information is still very incomplete,

however, and the study of relationships between strains derived from different sources has been fragmentary.

Interest in the group has been steadily increasing. From man a number of serotypes have been isolated. An important finding has been that the Eaton agent, a cause of pneumonitis, is a mycoplasma. In addition mycoplasmas have been found in cell cultures inoculated with material from leukaemic patients, and on occasion even in uninoculated cell cultures. Arising from all this there is an evident need for a laboratory prepared for the identification of strains on a considerable scale and for the systematic study of mycoplasmas.

A representative meeting to consider the mycoplasma problem met by invitation early in 1965. It was sponsored by the Public Health Laboratory Service and was attended by persons from academic, public health, and veterinary laboratories in England, Wales, and Scotland. At this meeting considerable feeling was expressed that there was sufficient interest and material of importance available to merit the setting up of a central investigative and typing laboratory whose interests should combine the medical and veterinary fields.

As a result of this expression of feeling and by reason of an allocation of money from the Research Funds from the Ministry of Health, a new Reference Laboratory is being established at Colindale, on a strictly experimental basis. It will hope to study material from both human and animal sources. At the present stage, and for some time to come, its physical resources of space and staff will be strictly limited. But with faith, hope, and charity as part of its constitution, and a desire to be useful, it is to be hoped that it will serve its purpose.



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Tel.: Salisbury 3231

P. J. Wormald, M.D., M.C.Path.
(Director)

SHREWSBURY:

Public Health Laboratory, Royal
Salop Infirmary
Tel.: Shrewsbury 4684/5

A. C. Jones, M.B. (*Director*)
P. H. Everall, F.I.M.L.T.
(*Technical Officer*)

SOUTHAMPTON:

Public Health Laboratory, General
Hospital, Tremona Road
Tel.: Southampton 76177

J. M. Graham, M.B., M.C.Path.,
Dip.Bact. (*Director*)

SOUTHEND:

Public Health Laboratory, Westcliff
Hospital, Balmoral Road
Tel.: Southend 45440

J. A. Rycroft, M.B., M.C.Path.,
Dip.Bact. (*Director*)

STAFFORD:

Public Health Laboratory, Martin
Street
Tel.: Stafford 4377

W. L. Hooper, B.Sc., M.B., M.C.Path.
(*Director*)

SUNDERLAND:

Public Health Laboratory, Havelock
Hospital, Hylton Road
Tel.: Sunderland 56256

P. B. Crone, M.D., Dip.Bact. (*Director*)

SWANSEA:

Public Health Laboratory,
Cockett Road
Tel.: Swansea 24041/2

W. Kwantes, M.B., F.C.Path.,
Dip.Bact. (*Director*)
D. G. Fleck, M.D., M.C.Path.,
Dip.Bact. *

TAUNTON:

Public Health Laboratory, Musgrove
Park Hospital
Tel.: Taunton 5753

J.A. Boycott, D.M. (*Director*)
P. Cavanagh, M.B., B.A.O., Dip.Bact.

TRURO:

Public Health Laboratory, Royal
Cornwall Hospital (City), Infirmary
Hill
Tel.: Truro 3029

G. I. Barrow, M.D., M.C.Path.,
Dip.Bact. (*Director*)

WAKEFIELD:

Public Health Laboratory, Wood
Street
Tel.: Wakefield 2207

L. A. Little, M.B., F.C.Path.,
(*Director*)
H. Fennell, B.Sc.

WATFORD:

Public Health Laboratory, Peace
Memorial Hospital
Tel.: Watford 21369

Mrs. B. H. E. Cadness-Graves, M.B.,
M.Sc., F.C.Path. (*Director, part-time*)

WINCHESTER:

Public Health Laboratory, Royal
Hampshire County Hospital
Tel.: Winchester 3807

M. H. Hughes, D.M., M.C.Path.,
D.T.M. & H., Dip.Bact. (*Director*)

WORCESTER:

Public Health Laboratory, Royal
Infirmary
Tel.: Worcester 25238/9

R. J. Henderson, M.D. (*Director*)

* To be Director of the Public Health Laboratory, St. George's Hospital,
Tooting Grove, London, S.W.17 from 1st September, 1966.

REFERENCE LABORATORIES

These Laboratories normally receive specimens only from other laboratories within or without the Service, although the Diagnostic Reference Laboratory also receives routine work; for this reason it is included in the Directory of Constituent Laboratories (*see pp. 19-24*).

CROSS-INFECTION REFERENCE LABORATORY:

(*incorporating the Staphylococcus and Streptococcus Reference Laboratories*):

Central Public Health Laboratory,
Colindale Avenue, N.W.9.

Tel.: Colindale 7041

M. T. Parker, M.D., F.C.Path.,
Dip.Bact. (*Director*)
Mrs. E. A. Hall Asheshov, M.Sc.,
Dip.Bact.
Miss J. F. Block, B.Sc.
W. D. Brighton, Ph.D.
S. Fletcher, B.Sc.
J. H. Hewitt, M.Sc.
W. R. Maxted, F.I.M.L.T. (*Senior
Technical Officer*)
Mrs. S. Polakoff, M.B.
D. Kingston, M.A.*
O. M. Lidwell, D.Phil.* (*Deputy
Director*)

DIAGNOSTIC REFERENCE LABORATORY

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9.

Tel.: Colindale 7041

C. E. D. Taylor, M.A., M.D., M.C.Path.,
Dip.Bact. (*Director: see also p. 22*)
A. H. Antonis, M.B.
G. Scrimgeour, M.B.
B. T. Thom, M.B., Dip.Bact.
G. V. Laubersheimer, F.I.M.L.T.
(*Technical Officer*)

DISINFECTION REFERENCE LABORATORY:

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9.

Tel.: Colindale 7041

J. C. Kelsey, M.D., M.C.Path.,
Dip.Bact. (*Director*)
Mrs. I. M. Maurer, B.Sc.

DYSENTERY REFERENCE LABORATORY:

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9.

Tel.: Colindale 7041

Mrs. K. P. Carpenter, M.B., M.C.Path.,
Dip.Bact. (*Director*)
Miss J. M. Hart, B.Sc.
Miss G. King, B.Sc.

ENTERIC REFERENCE LABORATORY:

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9.

Tel.: Colindale 7041

E. S. Anderson, M.D., F.C.Path.,
Dip.Bact. (*Director*)
Miss L. Glover, Dip.Tech.
Mrs. D. H. Perret, B.Sc., Ph.D.

LEPTOSPIROSIS REFERENCE LABORATORY:

London School of Hygiene and
Tropical Medicine, Keppel Street,
London, W.C.1.

Tel.: Museum 3041

L. H. Turner, M.B.E., M.D.,
D.T.M. & H. (*Director*)

MYCOLOGICAL REFERENCE LABORATORY:

London School of Hygiene and
Tropical Medicine, Keppel Street,
London, W.C.1.

Tel.: Museum 3041

I. G. Murray, M.B., M.C.Path.,
D.T.M. & H. (*Director*)
Miss C. Philpot, B.Sc.

*Members of the external scientific staff of the Medical Research Council.

MYCOPLASMA REFERENCE
LABORATORY:

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041

B. E. Andrews, M.R.C.S., M.C.Path.,
Dip.Bact. (*Director*)

SALMONELLA REFERENCE
LABORATORY:

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041

Mrs. J. Taylor, M.B., B.Sc., F.C.Path.,
D.P.H. (*Director*)
K. A. Bettelheim, M.Sc., D.I.C.
G. Fretwell, B.Sc.

TUBERCULOSIS REFERENCE
LABORATORY:

Institute of Preventive Medicine,
The Parade, Cardiff.
Tel.: Cardiff 30108

J. Marks, M.D., F.C.Path., Dip.Bact.
(*Director*)
J. L. Leat, B.Sc.
P. A. Jenkins, Ph.D.

VENEREAL DISEASES
REFERENCE LABORATORY:

London Hospital Research Labora-
tories, Ashfield Street, London, E.1.
Tel.: Stepney Green 3008

A. E. Wilkinson, M.R.C.S., M.C.Path.
(*Director, part-time*)
Miss N. A. Johnston, M.D., D.R.C.O.G.
(*part-time*)
Miss C. F. A. Rayner, B.Sc.
Miss M. J. Tully, B.Sc.

VIRUS REFERENCE
LABORATORY:

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041

A. D. Macrae, M.D., M.C.Path.,
Dip.Bact. (*Director*)
Miss M. O. Adams (Mrs. Roebuck),
M.B., Dip.Bact.
Miss Y. E. Cossart (Mrs. Wills), M.B.,
B.Sc., M.C.Path., D.C.P.
Miss A. M. Field, B.Sc.
Miss S. D. Gardner, M.B., Dip.Bact.
J. R. McDonald, F.I.M.L.T.
(*Technical Officer*)
Mrs. M. S. Pereira, M.D.
(*Deputy Director*)
Miss E. V. Williams, B.Sc.
G. D. Windsor, B.Sc.

SPECIAL LABORATORIES

EPIDEMIOLOGICAL RESEARCH
LABORATORY:

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041

T. M. Pollock, M.B., M.R.C.P. (Glasg.)
(*Director*)
* D. L. Miller, M.D.
P. M. Higgins, M.B., M.R.C.P.
(*part-time*)
J. C. Pope, B.Sc.
D. Reid, M.B.
Mrs. E. D. Vernon, B.Sc.

EPIDEMIOLOGICAL RESEARCH
UNIT:

86, Dyer Street, Cirencester, Glos.
Tel.: Cirencester 745

R. E. Hope-Simpson, O.B.E., M.R.C.S.
(*Director, part-time*)
P. G. Higgins, M.D., Dip.Bact.

FOOD HYGIENE LABORATORY:
Central Public Health Laboratory,
Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041

Miss B. C. Hobbs, O.St.J., D.Sc.,
Dip.Bact. (*Director*)
A. C. Ghosh, B.Sc.

* Awarded U.S. Public Health Fellowship for one year—returning October 1966

NATIONAL COLLECTION OF
TYPE CULTURES:

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041

S. P. Lapage, M.B., M.C.Path.,
Dip.Bact. (*Curator: see also p. 19*)
L. R. Hill, M.Sc. (*Deputy Curator*)
Miss J. Midgley, B.Sc.
Miss J. Shelton, B.Sc.
A. B. White, M.B.
(*to 1st October, 1966*)

STANDARDS LABORATORY
FOR SEROLOGICAL
REAGENTS:

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041

Mrs. C. M. P. Bradstreet, M.B.,
M.C.Path., Dip.Bact. (*Director*)
Miss E. M. Bailey, B.Sc.
Mrs. M. W. Dighero, B.Sc.
Mrs. J. M. B. Edwards, M.B., M.C.Path.
(*part-time*)
Miss G. J. Perry, B.Sc.
Miss A. J. Tannahill, B.Sc.

JUNIOR BACTERIOLOGISTS IN TRAINING

(*Attending course at The London School of Hygiene and Tropical Medicine for Diploma in Bacteriology, 1965-66*)

J. Craske, M.B.	J. V. S. Pether, M.A., B.M., D.T.M. & H.
A. E. Jephcott, B.A., M.B.	Miss E. M. Ross, M.B.
D. A. McSwiggan, L.R.C.P.I., D.T.M. & H.	J. S. Winchester, M.B.

STAFF ON SECONDMENT

J. F. Archer, M.B., Dip.Bact. (*to University of Sheffield*)
D. C. J. Bassett, M.B., Dip.Bact. (*to Trinidad Regional Virus Laboratory*)
P. G. Mann, M.D., M.C.Path., Dip.Bact. (*to Ministry of Public Health, Ethiopia*)
J. A. Tooth, M.B., Dip.Bact. (*to London School of Hygiene and Tropical Medicine*)
A. B. White, M.B. (*to St. George's Hospital, London: from 1st October 1966*)

*Hospital Pathological Laboratories—designated “Recognised”—at
which arrangements are made for the examination of
public health specimens for the Service*

AYLESBURY

Stoke Mandeville Hospital, Aylesbury, Buckinghamshire.

BOLTON

Royal Infirmary, Bolton, Lancashire.

WIGAN

Royal Infirmary, Wigan, Lancashire.

*Consultant Bacteriologists employed by Regional Hospital Boards in the
Hospital Service, who are associated on a part-time basis
with the Public Health Laboratory Service*

F. A. J. BRIDGWATER, M.B., Dip.Bact.,

East Birmingham Hospital, Bordesley Green East, Birmingham, 9.

S. I. JACOBS, M.D., M.C.Path.,

Bacteriology Laboratory, Monsall Hospital, Newton Heath, Manchester, 10.

Miss M. P. JEVONS, M.D., M.C.Path., Dip.Bact.,

Group Pathology Laboratories, St. Stephen's Hospital, Chelsea, London, S.W.10.

J. M. MOORE, M.D., M.C.Path.,

Bacteriology Laboratory, Doncaster Royal Infirmary, Doncaster, Yorkshire.

J. M. TALBOT, M.D., M.C.Path., Dip.Bact.,

Kingston Hospital Pathological Laboratory,
37 Coombe Road, Kingston-upon-Thames, Surrey.

W. R. G. THOMAS, M.B., M.R.C.S., M.C.Path., D.T.M. & H., Dip.Bact.,

Bacteriology Laboratory, Mayday Hospital, Mayday Road, Thornton Heath, Surrey.

REFERENCE EXPERTS

In the following list the name of the expert who is responsible for the relevant examination is given. Reference experts normally receive specimens only from other laboratories within and without the Service. It should be added, however, that all regional and most area laboratories are undertaking the routine diagnosis of virus infections, and that several laboratories are undertaking the serological identification of members of the *Salmonella* group, the serological diagnosis of leptospiral infections, and the bacteriophage-typing of strains of *Staphylococcus aureus*. For this reason, enquiries on these subjects should usually be addressed to the local public health laboratory.

Anaerobes, identification

Professor C. L. Oakley, M.D., D.Sc., F.C.Path., F.R.S., Bacteriology Department, School of Medicine, Leeds, 2. Tel.: Leeds 36171.

Anthrax bacilli, identification

A. J. H. Tomlinson, M.D., Bacteriological Laboratory (P.H.L.S.), Room 617, County Hall, London, S.E.1. Tel.: Waterloo 3467.

Anthrax, examination under Wool and Hair Regulations

T. F. Elias-Jones, M.B., M.C.Path., The City Laboratory, 23, Montrose Street, Glasgow, C.1. Tel.: Glasgow Central 9600, Ext. 2400.

H. G. M. Smith, M.B., Ph.D., Dip.Bact., Public Health Laboratory, 16-18, Edmund Street, Bradford, 5. Tel.: Bradford 24314.

A. J. H. Tomlinson, M.D., Bacteriological Laboratory (P.H.L.S.), Room 617, County Hall, London, S.E.1. Tel.: Waterloo 3467.

Arizona group, identification

Mrs. J. Taylor, M.B., B.Sc., F.C.Path., D.P.H., Salmonella Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale 7041.

Brucella, identification

D. J. H. Payne, M.B., F.C.Path., Dip.Bact., Public Health Laboratory, Priorsdean Hospital, Milton Road, Portsmouth. Tel.: Portsmouth 22331.

Clostridium welchii, serological typing

Miss B. C. Hobbs, D.Sc., Dip.Bact., Food Hygiene Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale 7041.

Coxsackie A viruses

D. R. Gamble, M.B., M.C.Path., Dip.Bact., Public Health Laboratory,
West Park Hospital, Epsom. Tel.: Epsom 26633.

Disinfection

J. C. Kelsey, M.D., M.C.Path., Dip.Bact., Disinfection Reference Laboratory,
Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041.

Dysentery, amoebic, complement-fixation test for

Mrs. C. M. P. Bradstreet, M.B., M.C.Path., Dip.Bact., Standards Laboratory
for Serological Reagents, Central Public Health Laboratory, Colindale
Avenue, London, N.W.9. Tel.: Colindale 7041.

Dysentery bacilli, typing

Mrs. K. P. Carpenter, M.B., M.C.Path., Dip.Bact., Dysentery Reference
Laboratory, Central Public Health Laboratory, Colindale Avenue, London,
N.W.9. Tel.: Colindale 7041.

Encephalitis, acute infectious

A. D. Macrae, M.D., M.C.Path., Dip.Bact., Virus Reference Laboratory,
Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041.

Enteric Fever

(a) Serological investigation of suspected cases and carriers.

(b) Phage-type determination of strains of typhoid and paratyphoid bacilli,
and of *Salmonella typhimurium* and certain other salmonella serotypes.

E. S. Anderson, M.D., F.C.Path., Dip.Bact., Enteric Reference Laboratory,
Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041.

Escherichia coli, typing

Mrs. J. Taylor, M.B., B.Sc., F.C.Path., D.P.H., Salmonella Reference
Laboratory, Central Public Health Laboratory, Colindale Avenue, London,
N.W.9. Tel.: Colindale 7041.

Entomological specimens, investigation

B. R. Laurence, Ph.D., Department of Entomology, London School of
Hygiene and Tropical Medicine, Keppel Street, London, W.C.1.
Tel.: Museum 3041

Farmer's lung, serological diagnosis

I. G. Murray, M.B., M.C.Path., D.T.M. & H., Mycological Reference Laboratory, London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1. Tel.: Museum 3041.

D. G. Davies, M.D., F.C.Path., Dip.Bact., Public Health Laboratory, Cumberland Infirmary, Carlisle. Tel.: Carlisle 22332.

J. E. Jameson, M.R.C.S., Public Health Laboratory, Royal Sussex County Hospital, Brighton, 7. Tel.: Brighton 63506.

B. Moore, M.B., B.Sc., M.C.Path., B.A.O., Public Health Laboratory, Bradninch Place, Gandy Street, Exeter. Tel.: Exeter 54959.

H. D. S. Morgan, M.R.C.S., M.C.Path., Dip.Bact., Public Health Laboratory, West Wales General Hospital, Glangwili, Carmarthen. Tel.: Carmarthen 7271.

Professor Scott Thomson, M.D., F.R.C.P.E., F.C.Path., D.P.H., Public Health Laboratory, Institute of Pathology, Royal Infirmary, Cardiff. Tel.: Cardiff 31918

D. M. Weir, M.D., Immunology Unit, Department of Bacteriology, Edinburgh University Medical School, Teviot Place, Edinburgh.
Tel.: Edinburgh Newington 1011, Ext. 2256.

*Food Poisoning**

Miss B. C. Hobbs, D.Sc., Dip.Bact., Food Hygiene Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041.

Fungi (pathogenic), identification

I. G. Murray, M.B., M.C.Path., D.T.M. & H., Mycological Reference Laboratory, London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1. Tel.: Museum 3041.

Helminthological specimens, investigation

Professor J. J. C. Buckley, D.Sc., London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1. Tel.: Museum 3041.

Hydatid disease, complement-fixation test for

Mrs. C. M. P. Bradstreet, M.B., M.C.Path., Dip.Bact., Standards Laboratory for Serological Reagents, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale 7041.

*Owing to the perishable nature of most foodstuffs, material for investigation from outbreaks of food poisoning should normally be sent to the nearest public health laboratory. The reference laboratory should be used mainly for non-perishable articles of food, especially when litigation may arise, and for the identification of strains.

Influenza

L. Hoyle, M.B., Public Health Laboratory, General Hospital, Northampton.
Tel.: Northampton 34347.

Leptospiral infections

L. H. Turner, M.B.E., M.D., D.T.M. & H., London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1. Tel.: Museum 3041.

Malaria

Professor P. C. C. Garnham, C.M.G., M.D., D.Sc., F.R.S., London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1.
Tel.: Museum 3041.

Meningococci, typing

Mrs. C. M. P. Bradstreet, M.B., M.C.Path., Dip.Bact., Standards Laboratory for Serological Reagents, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale 7041.

Mycoplasma

B. E. Andrews, M.R.C.S., M.C.Path., Dip.Bact., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041.

Parasitic infections, serological diagnosis of

D. S. Ridley, B.Sc., M.D., M.C.Path., Department of Pathology, Hospital for Tropical Diseases, 4, St. Pancras Way, London, N.W.1. Tel.: Euston 6441.

Pasteurella pseudotuberculosis

N. S. Mair, M.B., F.C.Path., D.C.H., D.P.H., Dip.Bact., Public Health Laboratory, Groby Road Hospital, Leicester. Tel.: Leicester 872283.

Plague, investigation

R. J. Henderson, M.D., Public Health Laboratory, Royal Infirmary, Worcester. Tel.: Worcester 25238/9.

Pneumococci, typing of, from epidemics

M. T. Parker, M.D., F.C.Path., Dip.Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale 7041.

Poliomyelitis

A. D. Macrae, M.D., M.C.Path., Dip.Bact., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041.

Protective cabinets

O. M. Lidwell, D.Phil., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041.

Protozoological specimens, investigation

Professor P. C. C. Garnham, C.M.G., M.D., D.Sc., F.R.S., London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1.
Tel.: Museum 3041.

Psittacosis, diagnosis

A. D. Macrae, M.D., M.C.Path., Dip.Bact., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041.

Rabies, laboratory tests for diagnosis

Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale 7041.

Salmonella organisms, typing

Mrs. J. Taylor, M.B., B.Sc., F.C.Path., D.P.H., Salmonella Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale 7041.

Smallpox, laboratory tests for diagnosis

J. H. Hale, O.B.E., M.D., F.C.Path., M.R.C.P., Public Health Laboratory, Institute of Pathology, General Hospital, Westgate Road, Newcastle upon Tyne, 4. Tel.: Newcastle 38811, Ext. 297.

M. H. Hambling, M.D., M.C.Path., D.(Obst.) R.C.O.G., Public Health Laboratory, Bridle Path, York Road, Leeds, 15. Tel.: Leeds 645011.

A. D. Macrae, M.D., M.C.Path., Dip.Bact., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041.

K. McCarthy, M.D., M.C.Path., Bacteriology Department, Medical School, Ashton Street, Liverpool, 3. Tel.: Liverpool Royal 7983 and Royal 6022, Ext. 202.

Professor Scott Thomson, M.D., F.R.C.P.E., F.C.Path., D.P.H., Public Health Laboratory, Institute of Pathology, 3rd Floor, Royal Infirmary, Cardiff. Tel.: Cardiff 24385.

Staphylococci, bacteriophage-typing

M. T. Parker, M.D., F.C.Path., Dip.Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale 7041.

Streptococci of Group A, typing

M. T. Parker, M.D., F.C.Path., Dip.Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale 7041.

Regional Typing Laboratories

(i) *Northern and South Eastern counties:* Cumberland, Co. Durham, Lancs., Northumberland, Westmorland, Yorks., Dorset, Hants., Kent, London, Surrey, Sussex.

M. T. Parker, M.D., F.C.Path., Dip.Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale 7041.

(ii) *Eastern Counties:* Beds., Cambs., Derby, Essex, Herts., Hunts., Leics., Lincs., Norfolk, Northants., Notts., Rutland, Suffolk.

Miss J. M. Boissard, M.R.C.S., Public Health Laboratory, Tennis Court Road, Cambridge. Tel.: Cambridge 55526.

(iii) *Western Counties:* Berks., Bucks., Cheshire, Cornwall, Devon, Glos., Heref., Oxon., Salop., Somerset, Staffs., Warw., Wilts., Worcs.

W. H. H. Jebb, M.D., F.C.Path., Public Health Laboratory, Radcliffe Infirmary, Oxford. Tel.: Oxford 49231/2.

(iv) *Wales.*

Professor Scott Thomson, M.D., F.R.C.P.E., F.C.Path., D.P.H., Public Health Laboratory, Institute of Pathology, 3rd Floor, Royal Infirmary, Cardiff. Tel.: Cardiff 24385.

Toxoplasmosis

North

G. B. Ludlam, M.D., F.C.Path., D.T.M. & H., D.L.O., Public Health Laboratory, Bridle Path, York Road, Leeds, 15. Tel.: Leeds 645011.

South

D. G. Fleck, M.D., M.C.Path., Dip.Bact., Public Health Laboratory, Cockett Road, Swansea. Tel.: Swansea 24041/2, (until 31st December, 1966 – thereafter at: Public Health Laboratory, St. George's Hospital, Tooting Grove, London, S.W.17. Tel.: Balham 1255.

Trichinosis, examination of rats and pigs

Professor J. J. C. Buckley, D.Sc., London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1. Tel.: Museum 3041.

Tubercle bacilli and other microbacteria

J. Marks, M.D., F.C.Path., M.R.C.P., Dip.Bact., Tuberculosis Reference Laboratory, Institute of Preventive Medicine, The Parade, Cardiff. Tel.: Cardiff 30108.

*Typhus Fever, serological tests**

Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale 7041.

Venereal diseases

A. E. Wilkinson, M.R.C.S., M.C.Path., Venereal Diseases Reference Laboratory, London Hospital Research Laboratories, Ashfield Street, London, E.1. Tel.: Stepney Green 3008.

Venereal diseases, Treponemal immobilisation test

A. E. Wilkinson, M.R.C.S., M.C.Path., Venereal Diseases Reference Laboratory, London Hospital Research Laboratories, Ashfield Street, London, E.1. Tel.: Stepney Green 3008.

Midlands

P. J. L. Sequeira, M.B., The Central Serological Laboratory, Withington Hospital, West Didsbury, Manchester, 20. Tel.: Didsbury 7683.

North

J. H. Hale, O.B.E., M.D., F.C.Path., M.R.C.P., Public Health Laboratory, Institute of Pathology, General Hospital, Westgate Road, Newcastle upon Tyne, 4. Tel.: Newcastle 38811, Ext. 297.

* The Weil-Felix test can be carried out in all constituent laboratories of the Service, and also in a number of hospital laboratories. Only sera giving a doubtful reaction should be sent to the Virus Reference Laboratory.

VACCINES AND SERA OBTAINABLE THROUGH THE PUBLIC HEALTH LABORATORY SERVICE

(These reagents are issued free of charge to medical officers of health and to general practitioners taking part in Local Health Authorities' arrangements made under Section 26 of the National Health Service Act)

Laboratory (For address see pp. 19-24)	Smallpox *Vaccine	Typhus Vaccine	Rabies Vaccine	Anthrax Vaccine
Birmingham	+	+	—	—
Bradford	—	—	—	+
Bristol	+	+	—	—
Cambridge	+	+	—	—
Carlisle	+	—	—	—
Derby	+	—	—	—
Dorchester	+	—	—	—
Exeter	+	+	—	—
Hereford	+	—	—	—
Ipswich	+	—	—	—
Leeds	+	+	—	—
Leicester	+	—	—	—
Lincoln	+	—	—	—
Liverpool	+	+	+	+
London (Colindale) ..	+	+	+	+
Maidstone	+	—	—	—
Manchester	+	+	—	—
Newcastle	+	+	+	—
Northallerton	+	—	—	—
Northampton	+	—	—	—
Norwich	+	—	—	—
Oxford	+	+	—	—
Preston	+	—	—	—
Sheffield	+	+	—	—
Stafford	+	—	—	—
Wakefield	+	—	—	—
Winchester	+	—	—	—
Cardiff (a)	+	+	+	—
Carmarthen	+	—	—	—
Conway	+	—	—	—

+ means that a stock is normally held. — means that a stock is not normally held.

NOTE 1.—Antisera for therapeutic use are obtainable through the Hospital Pathological Service.

NOTE 2.—*Gamma globulin* prepared from the pooled plasma of normal healthy adults is obtainable on request from any laboratory of the Service. So far as supplies allow, it is issued for the protection of women in contact with rubella during the first 3 months of pregnancy. It is also issued for contacts of measles and infectious hepatitis in circumstances of special risk.

In addition to normal gamma globulin, a stock of gamma globulin prepared from the blood of persons recently vaccinated against smallpox is held for the treatment of cases of generalised vaccinia, eczema vaccinatum, accidental vaccinal infections endangering the eye, and, in special circumstances, for the protection of unvaccinated smallpox contacts. This anti-vaccinal gamma globulin may be obtained from the P.H.L.S. laboratories at Birmingham, Bristol, Cambridge, Cardiff, Leeds, Liverpool, London (Colindale), Manchester, Newcastle, Oxford and Sheffield.

* In addition to the laboratories named officially below, many laboratories carry small supplies for the convenience of local medical practitioners.

NOTE 3.—*Yellow fever*: A list of centres where inoculation against this disease can be carried out is obtainable from the Ministry of Health, Alexander Fleming House, Elephant & Castle, London, S.E.1.

NOTE 4.—*T.A.B.C., cholera, and most other vaccines* are available commercially.

NOTE 5.—*Material for intradermal diagnostic tests*: Frei antigen for Lymphogranuloma inguinale, Brucellin for Undulant fever, Trichina antigen for Trichinosis, Hydatid antigen for Hydatid disease, and cat-scratch fever antigen can be obtained from the P.H.L.S. Standards Laboratory, which also issues, to any pathologist, Kveim antigen for sarcoidosis. Enquiries relating to fungal antigens should be addressed to the P.H.L.S. Mycology Reference Laboratory.

THE HISTORY OF THE
CITY OF BOSTON
FROM THE FIRST SETTLEMENT
TO THE PRESENT TIME
BY
JOHN HUTCHINGS
OF THE BARRISTER AT LAW
IN THE SUPREME COURT OF JUDICATURE
IN NEW ENGLAND
AND
OF THE BARRISTER AT LAW
IN THE SUPREME COURT OF JUDICATURE
IN GREAT BRITAIN
AND
OF THE BARRISTER AT LAW
IN THE SUPREME COURT OF JUDICATURE
IN IRELAND
IN TWO VOLUMES
THE SECOND VOLUME
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APPENDIX I

COMMITTEES AND WORKING PARTIES

Food Investigation

Chairman and Secretary: J. H. McCoy, M.B., D.P.H.

E. S. Anderson, M.D., F.C.Path., Dip.Bact.	Mrs. J. Taylor, M.B., B.Sc., F.C.Path., D.P.H.
R. W. S. Harvey, M.B., M.C.Path., Dip.Bact.	A. J. H. Tomlinson, M.D.
Miss B. C. Hobbs, D.Sc., Dip.Bact.	M. Ingram, M.A., Ph.D. (<i>Low Temperature Research Station</i>)
W. Kwantes, M.B., F.C.Path., Dip.Bact.	S. Brightwell, M.Sc., D.L.C., A.R.I.C. (<i>Messrs. J. Sainsbury, Ltd., to give technical advice on trade matters</i>)
H. D. S. Morgan, M.R.C.S., M.C.Path., Dip.Bact.	
H. G. M. Smith, M.B., Ph.D., Dip.Bact.	

Cross-Infection in Hospitals

(a) Autopsy Survey of Staphylococcal Infection (Steering Committee)

Chairman: M. T. Parker, M.D., F.C.Path., Dip. Bact.

Secretary: B. Moore, M.D., B.Sc., F.C.Path., B.A.O.

H. R. Cayton, M.B., M.C.Path.	Professor R. E. O. Williams, M.D., F.C.Path., M.R.C.P. (<i>St. Mary's Hospital Medical School</i>)
R. J. Henderson, M.D.	
K. E. A. Hughes, M.B.E., M.R.C.S.	

(b) Survey of Hospital-Acquired Infection in Medical Wards (Steering Committee)

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Secretary: R. Blowers, M.D., F.C.Path., M.R.C.P., Dip.Bact.

J. A. Boycott, D.M.	H. D. S. Morgan, M.R.C.S., M.C.Path., Dip. Bact.
R. J. Henderson, M.D.	

In addition to the members of the Steering Committees, a number of laboratories are taking part in one or other or both surveys.

Steering Committee on Antibiotic Resistance of Pathogens

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Secretary: A. L. Furniss, M.D., Dip. Bact.

J. D. Abbott, M.D., M.C.Path., Dip.Bact.	T. M. Pollock, M.B., M.R.C.P.Glas.
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(*Water Research Association*)

C. Metcalf Brown, M.D., D.P.H.
(*Society of Medical Officers of Health*)
N. P. Burman, B.Sc., Ph.D.
(*Metropolitan Water Board*)
G. U. Houghton, Ph.D., F.R.I.C. (*South Essex Waterworks Company*)
A. E. Martin, M.D., D.P.H.
(*Ministry of Health*)
E. Windle Taylor, C.B.E., M.A., M.D.,
F.C.Path., D.P.H. (*Metropolitan Water Board*)

Standing Committee on Virology

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D.(Obst.)R.C.O.G.
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A. J. H. Tomlinson, M.D.

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Secretary: R. Pilsworth, M.D., Dip. Bact.

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(Miss B. H. Whyte, M.A., A.L.A.)
Secretary: Miss B. H. Whyte, M.A., A.L.A.

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Secretary: J. O'Brien

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M. H. Hughes, D.M., M.C.Path., D.T.M. & H., Dip. Bact.	J. E. M. Whitehead, M.B., M.C.Path., Dip. Bact.
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A. D. Macrae, M.D., M.C.Path., Dip.Bact.	P. Henderson, M.D., D.P.H. (<i>Ministry of Education</i>)
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L. A. Little, M.B., F.C.Path., Dip.Bact.	Mrs. J. D. Coghlan, B.Sc., Ph.D. (<i>University of Edinburgh</i>)
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J. E. Jameson, M.R.C.S.	
B. Moore, M.D., B.Sc., F.C.Path., B.A.O.	

Working Parties on Acute Respiratory Virus Infections

(working in collaboration with the Medical Research Council Working Party)

Group I: Acute Respiratory Virus Infections in General Practice

Chairman: P. G. Higgins, M.D., M.C.Path., Dip. Bact.

Secretary: R. E. Hope-Simpson, O.B.E., M.R.C.S.

Group II: Acute Respiratory Virus Infections in Retail Shopworkers

Chairman and Secretary: T. D. F. Money, M.B., D.R.C.O.G.

Group III: Acute Respiratory Virus Infections among Children in Hospital

Chairman—Laboratory Group: J. O'H. Tobin, B.M., M.C.Path., Dip. Bact.

Chairman—Clinical Group: Professor S. D. M. Court, M.D., F.R.C.P.,
D.C.H. (University of Newcastle)

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J. E. M. Whitehead, M.B., M.C.Path.,
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C. L. Miller, B.M. (Medical Research
Council)

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Secretary: Mrs. E. D. Vernon, B.Sc.

H. R. Cayton, M.B., M.C.Path.

Miss L. M. Dowsett, M.D., F.C.Path.

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Professor Scott Thomson, M.D.,
F.R.C.P.E., F.C.Path., D.P.H.

R. H. Westlake

W. B. Fletcher, A.M.R., F.S.S. (Records
Officer, Bristol Public Health Dept.)

B. K. Kelly, M.A. (Medical Research
Council Computer Services Centre)

APPENDIX II

PUBLICATIONS BY MEMBERS OF THE STAFF OF THE PUBLIC HEALTH LABORATORY SERVICE DURING 1965

- ANDERSON, E. S.
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APPENDIX III

AWARDS AND EXTERNAL OFFICES ACCEPTED BY MEMBERS OF THE SERVICE DURING 1965

Dr. E. T. C. Spooner	..	..	Elected to a Fellowship of the Royal College of Physicians, following nomination by the Council of the College.
Dr. J. W. Howie	..	..	Named an Honorary Physician to the Queen (Q.H.P.).
Dr. R. Blowers	..	..	Member of the Council of the Association of Clinical Pathologists.
Dr. C. E. D. Taylor	..	..	Scientific Fellow of the Zoological Society of London.
Dr. Joan Taylor	..	..	Representative on the Council of the Society of Medical Officers of Health.
Dr. J. O'H. Tobin	..	..	President of the Section of Pathology of the Manchester Medical Society.

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