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Public Health Laboratory Service

1975 YEAR BOOK

including Annual Report for 1974

The Report on the work of the Service during 1974 commences on page 43.

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THE PUBLIC HEALTH LABORATORY SERVICE BOARD

The Board was established by the Public Health Laboratory Service Act, 1960.

The Chairman and members of the Public Health Laboratory Service Board are appointed by the Secretary of State for Social Services 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 microbiologists, appointed after consultation with such organisations as the Secretary of State 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 Secretary of State 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 Secretary of State may recognise as representative of practitioners so engaged.

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

Consequential upon the reorganisation of the National Health Service from 1 April 1974, arrangements are being made to amend (*c*).

THE PUBLIC HEALTH LABORATORY SERVICE BOARD

Chairman: C. E. Gordon Smith, CB, MD, DSc, FRCP, FRCPath.
(Dean, London School of Hygiene and Tropical Medicine, London)

Members: F. A. Adams, CB.
(lately Under-Secretary for Finance and Accountant General, Department of Health and Social Security)

H. M. Archibald, MBE, MB, FFCM, DPH.
(Deputy Chief Medical Officer, Department of Health and Social Security)

R. C. Bryant, CB.
(lately Under-Secretary, Board of Trade) (*to July 1975*)

G. D. Duncan, MB, FFCM, DPH.
(Regional Medical Officer, East Anglian Regional Health Authority) (*to April* 1975)

A. J. Essex-Cater, MRCS, FFCM, DCH, DPH, DIH, FRAI.
(lately Medical Officer of Health, Monmouthshire County Council) (*to July* 1975)

W. G. Harding, FRCP, FFCM, DPH.
(Area Medical Officer, Camden and Islington, London)

W. C. D. Lovett, OBE, MD, MFCM, DPH, DTM&H.
(Principal Medical Officer, Health and Social Work Department, Welsh Office, Cardiff) (*from August 1975*)

Professor K. McCarthy, MD, FRCPath.
(Professor of Medical Microbiology, University of Liverpool)

Professor D. D. Reid, MD, DSc, FRCP.
(Professor of Medical Statistics and Epidemiology, University of London, at London School of Hygiene and Tropical Medicine)

Professor M. H. Richmond, MA, PhD, MRCPath.
(Professor of Bacteriology, University of Bristol)

A. J. Rowland, MB, MFCM, DPH, DObstRCOG.
(District Community Physician, Bristol Health District (Teaching)) (*from August 1975*)

Professor J. A. Scott, MD, FFCM, BAO.
(Regional Medical Officer, Trent Regional Health Authority) (*from August 1975*)

Alderman Lady Sherman
(Member, The City and East London Area Health Authority (Teaching)) (*from August 1975*)

Professor R. A. Shooter, MA, MD, FRCP, FRCPath.
(Professor of Bacteriology, University of London, at St. Bartholomew's Hospital Medical School, London)

C. C. Stevens, OBE, LLB, FPS.
(Chairman, Cheshire Area Health Authority)

J. F. Warin, OBE, MA, MD, FRCP, FFCM, DPH.
(lately Medical Officer of Health, Oxford) (*to July 1975*)

G. I. Watson, OBE, MD, FRCGP, DTM&H.
(Medical Practitioner, Peaslake, Surrey)

Staff Assessors to the Board

B. Moore, MD, BSc, FRCPath. (*to October 1975*)
M. T. Parker, MD, FRCPath, Dip.Bact. (*to October 1975*)
Mrs. Marguerite S. Pereira, MD (*from November 1975*)
J. O'H. Tobin, BM, MRCP, FRCPath, Dp.Bact. (*from November 1975*)

Secretary:

J. D. Whittaker, CBE.

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R. H. Westlake (*Deputy Secretary to the Board*)

R. Toomey (*Finance Officer*)

B. D. Cunningham (*Establishments Officer*)

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* Member of the staff of the Medical Research Council.

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Further back-up facilities are provided by the Reference Laboratories, which carry out various tests for PHLS and for hospital laboratories throughout the United Kingdom. These tests often require special techniques and facilities which it would be uneconomic to provide in many centres, or which are so infrequently needed that it would be inefficient as well as uneconomic to multiply centres; in the case of other tests it may be considered that concentration provides special advantages for the collection of essential epidemiological information.

The Reference Laboratories not only carry out special laboratory tests, but also provide a great deal of advice to other laboratories and to hospital clinicians and administrators on the control of infection.

Quality Control is a new form of reference activity and the PHLS is in the process of developing for all NHS microbiological laboratories a service which will enable them to control their performance in the isolation of microbes, their identification, and the determination of antibiotic sensitivity. The Standards Laboratory provides an independent check on some of the diagnostic sera and bacterial suspensions available commercially in addition to producing a wide range of reagents itself; the VD Reference Laboratory checks commercial reagents for syphilis serology.

Monitoring the prevalence of infection

The Communicable Disease Report is prepared weekly by the Epidemiological Research Laboratory on the basis of reports received from PHLS and hospital laboratories throughout the British Isles; it provides rapid information on the number of cases of infective diseases diagnosed in these laboratories, and supplements the information available from statutory notification, the RCGP surveillance scheme and other sources of information. It is distributed, in confidence, to collaborating laboratories and designated health officers.

The Epidemiological Research Laboratory, the various Reference Laboratories and *ad hoc* working parties conduct special surveys within their fields to record the prevalence of particular infections. For some pathogens more specific identification may add greatly to the epidemiological value of this information. This may be done by the determination of their biotypes (chemical, serological or phage-type), their antibiotic sensitivity or the possession of genetic markers. The Reference Laboratories have special expertise with methods appropriate to the organisms with which they are concerned.

The PHLS is also responsible for surveillance of many immunization programmes, and for investigating new immunization methods.

Surveillance of food and drink

All PHLS laboratories provide a bacteriological service to local authorities for the routine examination of water, milk and, increasingly, other foodstuffs, particularly shellfish and imported foods examined at port of entry or centre of distribution. They are often called on to examine foodstuffs in the course of investigating outbreaks of infection and they may be invited to advise manufacturers.

ARRANGEMENTS FOR RECEIPT OF SPECIMENS

The material examined in PHLS laboratories comprises "clinical" specimens (ie throat swabs, blood, faeces, etc.) from persons suspected of suffering from some microbial disease, or of being carriers of some pathogenic microbe, and "sanitary" specimens, such as food and water, submitted either as part of epidemiological investigations or for routine public health surveillance.

Clinical specimens must be submitted by doctors, veterinarians, dentists, or by public health inspectors and others acting on behalf of the appropriate medical officers in local or central health authorities. Clinical specimens cannot be accepted from private persons.

Sanitary specimens can be submitted by the medical officers and the environmental health officers (or their staff) acting on behalf of local authorities. The PHLS is always ready to give advice to food manufacturers and distributors and to carry out limited bacteriological investigations to this end but does not ordinarily undertake routine examinations for commercial organisations.

The Reference and Special Laboratories ordinarily receive specimens only from other laboratories; their facilities are available to all NHS and other official laboratories in the United Kingdom.

DISTRIBUTION OF VACCINES, SERA AND REAGENTS

Some PHLS laboratories (p. 28) hold stocks of rabies vaccine and antiserum, anthrax vaccine, and anti-vaccinia immunoglobulin.

The PHLS Standards Laboratory provides antigens for a number of diagnostic skin tests (p. 29) and also a range of reagents for laboratory diagnostic tests (p. 28). The PHLS Mycological Reference Laboratory can provide some skin test antigens for the diagnosis of fungal disease.

RESEARCH

Most PHLS laboratories are engaged in some research, and many of the larger Regional Laboratories, as well as the Reference Laboratories, have extensive research programmes; some of these are noted in the Director's Report (p. 43). The Service has a number of Committees (p. 33) which organise collaborative research projects and are able to test new ideas and new methods in a variety of circumstances.

The Directors of all the Regional and Area laboratories, and of almost all the Reference and Special laboratories, are medically qualified and have NHS consultant status. Many laboratories have two or more consultants as well as junior medical staff in grades equivalent to those in the hospital service. In an increasing number of laboratories there are additional medical staff employed by Regional Health Authorities, holding honorary contracts with the PHLS. Posts at consultant level are advertised and filled through Advisory Appointments Committees. They are thus open to candidates from outside the Service as well as to PHLS trainees.

The PHLS provides an integrated training programme for junior medical staff, who are commonly recruited soon after completing pre-registration house appointments; they are given the opportunity of taking postgraduate courses at London or Manchester, and are provided with good facilities for study towards the membership of the Royal College of Pathologists. All are encouraged to undertake research projects suitable for submission for the MD degree.

An increasing number of PHLS laboratories have posts for science graduates, without a medical qualification, both at post-graduate and post-doctoral level. In many laboratories it is possible for such graduates to conduct part-time research leading to the PhD degree.

The technical staff of the laboratories are generally recruited from school-leavers who have attained the standard of education required for entry to the IMLT or ONC examinations. They are given full opportunities for attending training courses. Senior technical posts are advertised and may be filled by candidates from hospital laboratories or, in a small number of cases, by science graduates.

DIRECTORY OF THE SERVICE

Distribution of Public Health Laboratories in England and Wales—
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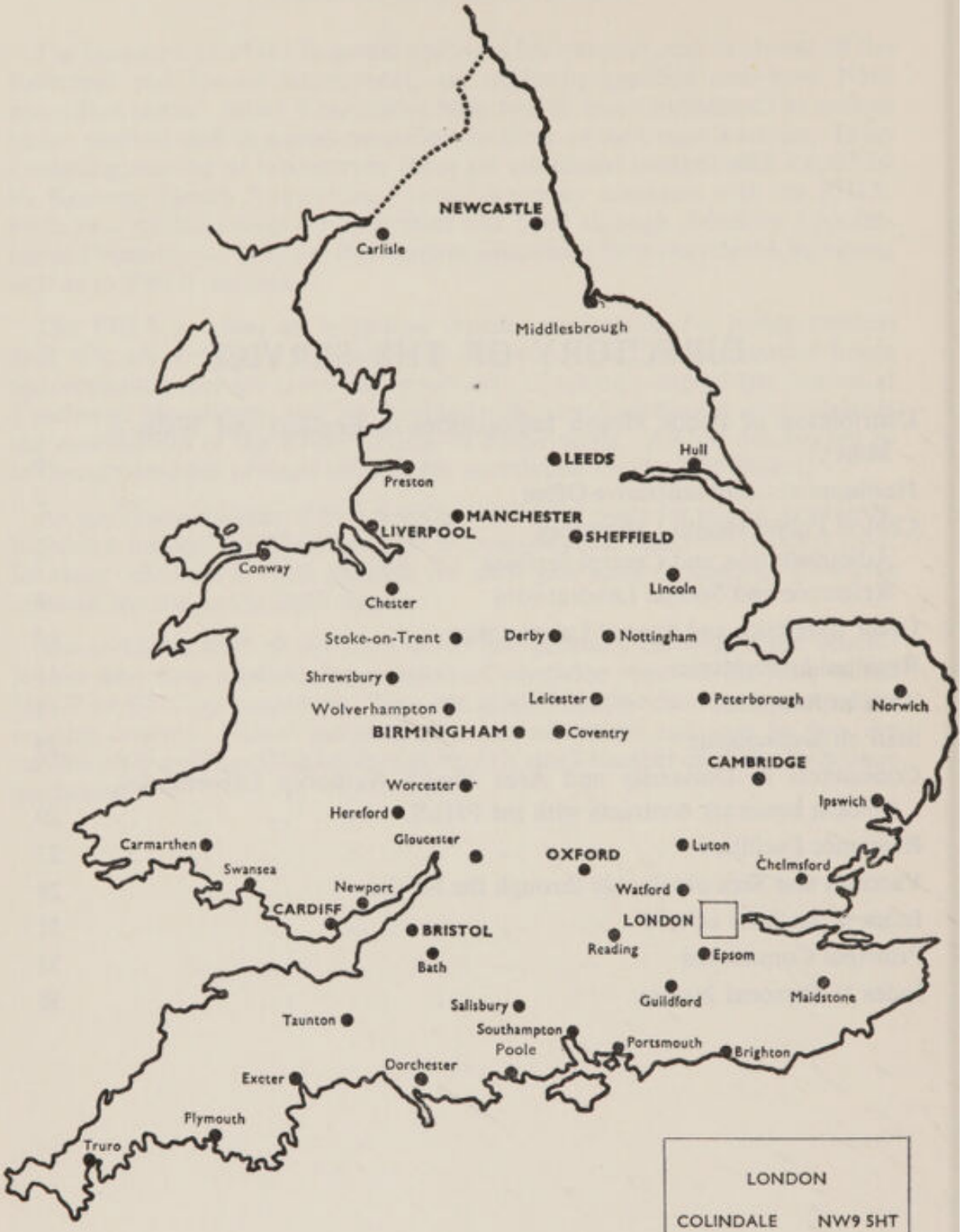

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Dulwich	SE22 8QF
Tooting	SW17 OQT
Whipps Cross	E11 1MR

DIRECTORY OF THE SERVICE

(Staff in post at 1 September 1975)

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J. E. M. Whitehead, MA, MB, FRCPath, Dip.Bact. (*Deputy Director of the Service*)

J. D. Whittaker, CBE. (*Secretary to the Board*)

R. H. Westlake (*Deputy Secretary to the Board*)

R. Toomey (*Finance Officer*)

B. D. Cunningham (*Establishments Officer*)

R. V. Jackson (*Accountant*)

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†S. P. Lapage, MB, FRCPath, Dip.Bact. (*Administrative Director: see also* p. 8)

†B. Rowe, MA, MB, DTM&H (*Deputy Administrative Director: see also* p. 9)

H. L. Lloydbottom, AHA. (*Administrator*)

H. Barraclough, FIMLT. (*Media Production Department Manager*)

Mrs. Vivienne M. Taylor, BSc. (*Media Production Department*)

Central Library

Miss Betty H. Whyte, MA, ALA. (*Librarian*)

J. W. Barrington, BA. (*Assistant Librarian*)

Mrs. Susan E. L. M. Wilson, FPE (*Assistant Librarian*)

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* Member of the staff of the Medical Research Council.
† These appointments are now held on a rotating basis.

REFERENCE AND SPECIAL LABORATORIES
at the Central Public Health Laboratory.

References:

D	*Director*	M & S	*Other Medical and Scientific Staff*
DD	*Deputy Director*	STO	*Senior Technical Officer*
CC	*Curator*	TO	*Technical Officer*
DC	*Deputy Curator*	HT	*Head Technician*
C	*Consultant*		

COMPUTER TRIALS DEPARTMENT

D — S. P. Lapage, MB, FRCPath, Dip.Bact.

M & S — B. Holmes, MSc.
W. R. Willcox, BSc, MBCS.

CROSS-INFECTION REFERENCE LABORATORY

D — M. T. Parker, MD, FRCPath, Dip.Bact.

DD — *O. M. Lidwell, DPhil.

C — R. R. Marples, BM, MSc, MRCPath.

M & S — Mrs. Elizabeth A. Hall Asheshov, PhD, MRCPath, Dip.Bact.
Miss Gillian Hallas, BSc.
Mrs. Hilary A. Harrop, BSc.
E. McKay-Ferguson, MB, MRCS, Dip.Bact.
*C. A. Mackintosh, BA, MSc.
W. R. Maxted, Hon.Dr.(Leiden), MIBiol, FIMLT.
Mrs. Audrey Porthouse, BSc.
Miss Judith F. Richardson, BSc.
Mrs. Jacqueline Stringer, BSc.
Mrs. Adeline G. Towers, BSc, MB, MRCPath (*part-time*)
Miss Sheena A. Waitkins, PhD.
Mrs. Jean P. Widdowson, BPharm, PhD, MPS.

HT — A. W. Coe

DISINFECTION REFERENCE LABORATORY

D — J. C. Kelsey, MD, FRCPath, Dip.Bact.

M & S — D. Coates, PhD.

ENTERIC REFERENCE LABORATORY

D — Professor E. S. Anderson, MD, DSc, FRCP, FRCPath, FIBiol, Dip.Bact, FRS.

M & S — Mrs. Jacqueline Carr, BSc.
J. D. H. de Sa, MSc, PhD.
Mrs. Maureen de Saxe, BSc. (*part-time*)
Mrs. Jennifer Frost, MSc.
Miss Moyra McConnell, BSc.
Miss Christine J. Seymour, BSc.
H. R. Smith, BA.
E. J. Threlfall, PhD.
Mrs. Linda R. Ward, BSc.
Mrs. Geraldine Willshaw, PhD.

HT — F. J. Flynn

EPIDEMIOLOGICAL RESEARCH LABORATORY

D — T. M. Pollock, MB, MRCP(Glasg.), FFCM.

DD — J. W. G. Smith, MD, FRCPath, MFCM, Dip.Bact.

C — Mrs. Sheila Polakoff, MA, MD, MFCM, DPH.
Miss Mair E. M. Thomas (Mrs. Livingstone), MB, BSc, FRCPath, MFCM, DPH. (*part-time*)

M & S — †Mrs. Rosemary E. Clifford, MSc. (*part-time*)
G. Cust, MB, MFCM, DPH, DTM&H. (*Honorary, part-time*)
W. B. Fletcher, AMR, FSS.
C. Gazidis, MB, MFCM, DSM.
Mrs. Betty R. Kirkwood, BA, MSc.
Miss Christine L. Miller (Mrs. Manning), BM. (*part-time*)
N. D. Noah, MB, MRCP.
Mrs. Enid D. Vernon, BSc.
Miss Patricia J. Wherry, BSc.

---

* Members of the external scientific staff of the Medical Research Council.
†At London School of Hygiene and Tropical Medicine.

FOOD HYGIENE LABORATORY

D	Miss Betty C. Hobbs, OStJ, DSc, FRCPath, Dip.Bact.
DD	R. J. Gilbert, MPharm, PhD, MRCPath, Dip.Bact, MPS
M & S	A. C. Ghosh, BSc, BVSc&AH, MPhil.
	Miss Diane Roberts, BSc.
	M. F. Stringer, BSc.
	P. C. B. Turnbull, MSc, PhD.
	Miss Antonnette A. Wieneke, Drs. (Holland).
HT	Miss Margaret Kendall, FIMLT.

MYCOPLASMA REFERENCE LABORATORY

D	B. E. Andrews, MRCS, FRCPath, Dip.Bact.
DD	R. H. Leach, MSc, DPhil.
HT	R. A. Hewish, FIMLT

NATIONAL COLLECTION OF TYPE CULTURES

CC	S. P. Lapage, MB, FRCPath, Dip.Bact.
DC	L. R. Hill, MSc, MIBiol.
M & S	I. S. Bowie, MSc, PhD.
	J. Hine, BSc.
	Miss Rita M. Legros, BSc.
	R. J. Owen, BSc, MPhil.
	J. A. Taylor, BSc.
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SALMONELLA AND SHIGELLA REFERENCE LABORATORY

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M & S	T. Cheasty, BSc.
	R. J. Gross, MA, MIBiol.
	Mrs. Mary L. M. Hall, BSc.
	Mrs. Sylvia M. Scotland, MSc,PhD.
	Mrs. Christine R. Shipp, BA
	Mrs. Jane K. Smith, PhD.
	Miss Elizabeth Whiteside, BSc.
HT	D. P. Woodroof, FIMLT.

STANDARDS LABORATORY FOR SEROLOGICAL REAGENTS

D	Mrs. C. M. Patricia Bradstreet, MB, FRCPath, Dip.Bact.
	Miss Kathryn Bellamy, BA.
M & S	Mrs. Terese Bloch, BSc.
	Mrs. Mabel W. Dighero, BSc. (*part-time*)
	Mrs. Agnes J. Macara, BSc.
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	Miss Catherine Page, BSc.
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	Mrs. E. Margaret Supran, BSc.
HT	J. Foreman, FIMLT.

VIRUS REFERENCE LABORATORY

D	Mrs. Marguerite S. Pereira, MD.
C	Miss Yvonne E. Cossart (Mrs. Wills), MB, BSc, MRCPath, DCP.
	Mrs. Joan M. B. Edwards, MB, MRCPath.
M & S	Mrs. Hazel Appleton, PhD.
	Mrs. Pratima Chakraverty, BSc, MPhil.
	B. J. Cohen, BSc.
	Miss Anne M. Field, PhD.
	Miss Sylvia D. Gardner (Mrs. Kingsbury), MB, MRCPath, Dip. Bact.
	Mrs. Patricia E. Gibson, MSc.
	Miss Wendy A. Knowles, BSc.
	P. P. Mortimer, MB, Dip.Bact.
	F. G. Rodgers, BSc. (*to November 1975*)
	Mrs. Mary O. Roebuck, MB, Dip.Bact. (*part-time*)
	Mrs. Elise M. Vandervelde MB, Dip.Bact.
STO	J. R. McDonald, FIMLT.
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BACTERIAL METABOLISM RESEARCH LABORATORY

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Colindale Hospital, Colindale Avenue, London, NW9 5DX
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‡ Consultant Microbiologists employed by the Welsh National School of Medicine.
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	R. E. A. Barrell, BSc.
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D	J. H. Hale, OBE, MD, FRCP, FRCPath.
DD	*J. B. Selkon, MB, MRCPath, DCP.
C	A. A. Codd, MD, Dip.Bact.
	*H. R. Ingham, MB, MRCPath, Dip.Bact.
HT	J. A. Hall, FIMLT.

OXFORD

Public Health Laboratory, Radcliffe Infirmary, Oxford, OX2 6AH
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D	J. O'H. Tobin, BM, FRCPath, MRCP, Dp.Bact.
DD	H. H. Johnston, MA, DPhil.
	‡D. C. Turk, DM,MRCP,FRCPath.
M & S	Mrs. Glynis A. Guthrie, BSc.
	C. J. Mitchell, BSc, MB, MRCS.
	J. Sellers, MB, BSc.
	Mrs. Barbara M. Tobin, PhD, Dp.Bact. (*part-time*)
	A. H. Tomlinson, MA, DPhil, FRCPath.
HT	A. Peacock.

PORTSMOUTH

A Regional Public Health Laboratory from 1 August 1975 (*see* p. 17)

SHEFFIELD

Public Health Laboratory, Northern General Hospital, Herries Road, Sheffield, S5 7AU
Tel.: Sheffield (STD 0742) 387253

D	E. H. Gillespie, MB, FRCPath (*to November 1975*)
	B. W. Barton, MB, MRCPath, Dip.Bact. (*from December 1975*)
DD	Miss Margaret A. M. Wilson, MB, FRCPath, Dip.Bact.
C	A. E. Jephcott, MA, MB, MRCPath, Dip.Bact.
M & S	D. B. McGechie, MB, MRCS, MRCPath, Dip.Bact.
HT	W. A. Sutcliffe, FIMLT.

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† Consultant Microbiologists employed by Manchester Area Health Authority (Teaching).
‡ Consultant Microbiologist employed by Oxfordshire Area Health Authority (Teaching).

BATH
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D P. G. Mann, MD, MRCPath, Dip.Bact.
M & S Miss Monica Zealley (Mrs. Mann), MB.
HT D. W. Marshall, FIMLT.

BRIGHTON
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D B. T. Thom, MB, MRCPath, Dip.Bact.
C §Mrs. Betty E. Wallace, MA, MD, FRCPath, BAO.
HT G. H. Burrell, AIMLT.

CARLISLE
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D D. G. Davies, MD, FRCPath, Dip.Bact.
HT A. R. Wood, FIMLT.

CARMARTHEN
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D H. D. S. Morgan, MRCS, FRCPath, Dip.Bact.
HT G. Davies, AIMLT.

CHELMSFORD
Public Health Laboratory, Writtle Street, Chelmsford, CM2 0QH
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D R. Pilsworth, MD, Dip.Bact.
DD J. A. Rycroft, MA, MB, FRCPath, Dip.Bact.
HT P. Maybury, FIMLT.

CHESTER
Public Health Laboratory, Chester City Hospital, Hoole Lane, Chester, CH2 3EG
Tel.: Chester (STD 0244) 21417

D Miss Pauline M. Poole, MD, FRCPath, BAO, Dip.Bact.
DD *J. H. Pennington, MD, MRCPath.
HT D. Breckon, FIMLT.

CONWY
Public Health Laboratory, "Bryn Hyfryd", Conwy, LL32 8PG
Tel.: Conwy (STD 0492-63) 2478

D A. J. Kingsley Smith, BM, MRCPath.
C †F. B. Jackson, MB, FRCPath.
HT K. L. Thomas, MPhil, FIMLT.

COVENTRY
Public Health Laboratory, Coventry and Warwickshire Hospital, Stoney Stanton Road, Coventry, CV1 4FH
Tel.: Coventry (STD 0203) 24055

D Mrs. Evelyn M. Finnie, MD, MSc.
M & S ‡M. J. Robertson, MRCS, DTM&H, Dip.Bact.
J. S. Winchester, MB, MRCPath, Dip.Bact. (*part-time*)
HT M. W. Scruton, FIMLT.

---

* Consultant Microbiologist employed by the Mersey Regional Health Authority.
† In charge of the Sub-Laboratory at the Royal Alexandra Hospital, Rhyl.
‡ Seconded from Regional Public Health Laboratory, Birmingham.
§ Consultant Microbiologist employed by South-East Thames Regional Health Authority.

DERBY
Public Health Laboratory, 121a, Osmaston Road, Derby DE1 2GB
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D	B. W. Barton, MB, MRCPath, Dip.Bact. (*to November 1975*)
M & S	R. Darnell, MB, Dip.Bact.
HT	G. R. Cowburn, FIMLT.

DORCHESTER
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D	G. H. Tee, MRCS, FRCPath, PhD.
M & S	Miss Patricia A. Barwell, MB.
HT	E. F. C. Coetzee, FIMLT.

EPSOM
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DD	Miss Elizabeth I. Tanner, MB, MRCPath, Dip.Bact.
M & S	T. J. Coleman, MB, DPhil. D. V. Seal, MB, MRCS, Dip.Bact.
HT	C. H. Bullin, FIMLT.

EXETER
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D	B. Moore, MD, BSc, FRCPath.
DD	R. J. C. Hart, MB, MRCS, FRCPath, Dip.Bact.
M & S	J. B. Kurtz, MA, MB, MRCP. W. J. Ryan, MB, DPH, Dip.Bact. Mrs. Elizabeth McC. White, MD, DPH, DCH.
HT	D. T. Lansdowne, FIMLT.

GLOUCESTER
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D	A. E. Wright, TD, MD, FRCPath, DPH, Dip.Bact.
C	*A. P. C. H. Roome, MB, MRCPath.
HT	G. Spence, FIMLT.

GUILDFORD
Public Health Laboratory, St. Luke's Hospital, Guildford, GU1 3NT
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D	Miss Joan R. Davies, MD, Dip.Bact.
DD	R. Y. Cartwright, MB, MRCPath.
C	†C. E. Watson, BSc, MB, FRCPath.
M & S	Mrs. E. Valerie Meurisse, MSc. Miss Sheila Payne, BSc.
HT	A. J. Smith, FIMLT.

HEREFORD
Public Health Laboratory, County Hospital, Hereford, HR1 2ER
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D	D. R. Christie, MB, Dip.Bact.
HT	G. W. Taylor, FIMLT.

HULL
Public Health Laboratory, Hull Royal Infirmary, Anlaby Road, Hull, HU3 2JZ
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D	J. H. McCoy, MB, DPH.
HT	G. E. Spain, FIMLT.

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IPSWICH

Public Health Laboratory, Ipswich Hospital, Ipswich, IP4 5PD

Tel.: Ipswich (STD 0473) 710927

D P. K. Fraser, MD, FRCP, FRCPath.
HT G. K. Bailey, FIMLT.

LEICESTER

Public Health Laboratory, Groby Road Hospital, Leicester, LE3 9QE

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D N. S. Mair, MB, FRCPath, DCH, DPH, Dip.Bact.
DD Mrs. Hélène J. Mair, MD, MRCPath, Dip.Bact.
HT E. Fox, FIMLT.

LINCOLN

Public Health Laboratory, St. Anne's Road, Lincoln, LN2 5RF

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D J. G. Wallace, BM, MRCPath, DCP, Dip.Bact.
HT R. Clark, FIMLT.

LONDON

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D C. E. D. Taylor, MA, MD, FRCPath, Dip.Bact.
DD *D. A. McSwiggan, LRCPI, MRCPath, DTM&H. Dip.Bact.
M & S A. A. G. Saeed, MB, PhD, Dip.Bact, DAP&E.
TO G. V. Heimer, FIMLT.
HT D. F. Halliday, FIMLT.

LONDON (*continued*)

DULWICH

Public Health Laboratory, Dulwich Hospital, East Dulwich Grove, London, SE22 8QF

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D C. Dulake, MB, MRCPath, Dip.Bact.
M & S C. J. Noble, MB.
M. D. Yates, BSc.
STO C. H. Collins, MBE, MIBiol, FIMLT.
HT W. N. Farrant, FIMLT.

TOOTING

Public Health Laboratory, St. George's Hospital, Blackshaw Road, London, SW17 0QT

Tel.: 01-672 1255

D D. G. Fleck, MD, FRCPath, Dip.Bact.
M & S Miss Janet E. M. Strangeways, MB, MRCS, MRCPath.
HT B. S. Chessum, FIMLT.

WHIPPS CROSS

Public Health Laboratory, Whipps Cross Hospital, Whipps Cross Road, London, E11 1NR

Tel.: 01-539 5223

D B. Chattopadhyay, MB, MRCPath, DCP.
HT J. N. Pilfold, FIMLT.

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LUTON

Public Health Laboratory, Luton and Dunstable Hospital, Lewsey Road, Luton, LU4 0DZ
Tel.: Luton (STD 0582) 52007

D	A. T. Willis, MD, PhD, DSc, FRCPA, FRACP, MRCPath.
M & S	Mrs. Catherine L. Bullen, MRCVS. (*part-time*)
	I. R. Ferguson, MB, MRCS, Dip.Bact.
	P. H. Jones, MB.
	K. D. Phillips, BSc.
HT	R. Burt, FIMLT.

MAIDSTONE

Public Health Laboratory, Preston Hall, Maidstone, ME20 7NH
Tel.: Maidstone (STD 0622) 77155.

D	A. L. Furniss, MD, Dip.Bact.
DD	Miss Ruth C. J. James (Mrs. Barkhan), MB, MRCPath, Dip.Bact. (*part-time*)
C	*Miss Helen G. Ross (Mrs. Jealous), MB, MRCPath, DTM&H, Dip.Bact.
M & S	J. V. Lee, PhD.
HT	T. J. Donovan, FIMLT.

MIDDLESBROUGH
(formerly TEESSIDE)

Public Health Laboratory, General Hospital, Ayresome Green Lane, Middlesbrough, Cleveland, TS5 5AZ
Tel.: Middlesbrough (STD 0642) 87766

D	P. R. Mortimer, MB, MRCPath.
HT	W. H. Bound, FIMLT.

NEWPORT

Public Health Laboratory, Clytha Square, Newport, Gwent, NPT 2TZ
Tel.: Newport (STD 0633) 63248

D	R. D. Gray, MD, FRCPath, DPH.
TO	G. H. Lowe, FIMLT
HT	D. Banner, FIMLT.

NORWICH

Public Health Laboratory, Bowthorpe Road, Norwich, NR2 3TX
Tel.: Norwich (STD 0603) 611816

D	W. Shepherd, MD, FRCPath.
C	†C. G. A. Thomas, MA, BM, MRCP, FRCPath.
M & S	Miss Margaret Fitt, BSc.
HT	S. J. Line, FIMLT.

NOTTINGHAM

Public Health Laboratory, City and Sherwood Hospitals, Hucknall Road, Nottingham, NG5 1PH
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D	E. R. Mitchell, MB, MRCPath, Dip.Bact.
DD	‡A. D. Macrae, MD, FRCPath, Dip.Bact.
C	‡Miss Purvin Ispahani, MB, MRCPath, Dip.Bact, DCP.
	§M. J. Lewis, MD, Dip.Bact.
	**Professor F. W. O'Grady, TD, MSc, FRCPath.
M & S	S. L. Mawer, MB.
	F. G. Rodgers, BSc.
HT	P. W. Greaves, FIMLT.

---

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† Consultant Microbiologist employed on behalf of the East Anglian Regional Health Authority.

‡ Consultant Microbiologists employed on behalf of the Nottinghamshire Area Health Authority (Teaching).

§ Seconded to Department of Medical Microbiology, Medical School, University of Nottingham.

** Professor of Medical Microbiology, University of Nottingham.

PETERBOROUGH
Public Health Laboratory, St. John's Hospital, Thorpe Road, Peterborough, PE3 6JW
Tel.: Peterborough (STD 0733) 67451, *Ext.* 656

D E. J. G. Glencross, MB, FRCPath, Dip.Bact.
HT M. W. D. Buxton, FIMLT.

PLYMOUTH
Public Health Laboratory, Plymouth General Hospital, Greenbank Road, Plymouth, PL4 8NN
Tel.: Plymouth (STD 0752) 63997

D P. D. Meers, MD, FRCPath, Dip.Bact.
DD *Miss Gillian M. Churcher, MB, MRCPath, Dip.Bact.
M & S M. W. Calder, MB. (*part-time*)
J. H. Hewitt, MSc.
HT G. H. Sandys, FIMLT.

POOLE
Public Health Laboratory, Poole General Hospital, Poole, Dorset, BH15 2JB
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D W. L. Hooper, BSc, MB, MRCPath, Dip.Bact.
HT M. S. Jones, FIMLT.

PORTSMOUTH
Public Health Laboratory, St. Mary's General Hospital, East Wing, Milton Road, Portsmouth, PO3 6AQ
Tel.: Portsmouth (STD 0705) 22331
A Regional Laboratory from 1 August 1975 (*see* p. 12)

D D. J. H. Payne, MB, FRCPath, MRCP, Dip.Bact.
DD J. V. T. Gostling, MA, MB, MRCS, FRCPath.
C §J. M. Graham, MB, FRCPath, Dip.Bact. (*part-time*)
†O. A. Okubadejo, MD, MRCPath, DCP.
M & S Mrs. Rosalind Maskell, MA, BM, DObstRCOG (*part-time*).
Mrs. Veronica M. Payne, BSc.
A. D. Pearson, BA, BM, Dip.Bact.
HT R. A. Quaife, FIMLT.

PRESTON
Public Health Laboratory, Royal Infirmary, Meadow Street, Preston, PR1 6PS
Tel.: Preston (STD 0772) 53975

D L. Robertson, MA, BM, FRCPath.
DD ‡D. N. Hutchinson, MD, Dip.Bact.
M & S I. D. Farrell, PhD.
HT H. C. Dawkins, FIMLT.

READING
Public Health Laboratory, Royal Berkshire Hospital, Reading, RG1 5AN
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D J. V. Dadswell, MB, MRCPath.
C Mrs. Hilary J. Andrews, BSc, MB, MRCP, MRCPath.
M & S Mrs. Nesta J. Sellwood, BSc.
HT R. C. Masters, FIMLT.

---

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† Consultant Microbiologist employed on behalf of the Wessex Regional Health Authority.
‡ Consultant Microbiologist employed by the North Western Regional Health Authority.
§ Seconded part-time to Hampshire Area Health Authority (Teaching) for duty at Winchester.

SALISBURY
Public Health Laboratory, Odstock Hospital, Salisbury, SP2 8BJ
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D	P. J. Wormald, MD, FRCPath.
M & S	Miss Enid M. Carpenter (Mrs. Hornigold), MB. D. E. J. Dicks, MSc.
HT	A. S. Greasby, FIMLT.

SHREWSBURY
Public Health Laboratory, Mytton Oak Road, Shrewsbury, SY3 8XH
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D	C. A. Morris, BSc, MD, Dip.Bact.
DD	*N. J. Mitchell, MB, MRCS, MRCPath, Dip.Bact.
TO	P. H. Everall, FIMLT.
HT	D. A. Porter, FIMLT.

SOUTHAMPTON
Public Health Laboratory, General Hospital, Tremona Road, Southampton, SO9 4XY
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D	A. M. R. Mackenzie, BA, BSc, BM, MRCPath, Dip.Bact.
C	†Professor P. J. Watt, MD, MRCS, MRCP.
HT	W. G. Suckling, AIMLT.

STOKE
Public Health Laboratory, Central Pathology Laboratory, Hartshill Road, Hartshill, Stoke-on-Trent ST4 7PX
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C	*C. R. Knappett, MD, MRCPath, Dip.Bact.
HT	L. J. Haughton, FIMLT.

SWANSEA
Public Health Laboratory, Cockett Road, Swansea, SA2 0FA
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M & S	Mrs. Barbara R. Ivey, MB. (*part-time*)
HT	R. Brooks, FIMLT.

TAUNTON
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D	J. V. S. Pether, MA, BM, MRCPath, DTM & H, Dip.Bact.
M & S	Mrs. Patricia M. Benn, MB. (*part-time*) Miss Phillippa H. Trevains, BSc.
HT	F. B. Greatorex, FIMLT.

TEESSIDE
Under Local Government reorganisation Teesside no longer exists. The Laboratory has reverted to being listed under MIDDLESBROUGH.

TRURO
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D	G. I. Barrow, MD, FRCPath, Dip.Bact.
M & S	J. C. K. Mills, MA, MB, Dip.Bact.
HT	C. Ellis, FIMLT.

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† Professor of Medical Microbiology, University of Southampton.

WATFORD
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HT	Miss Hilda Taylor, FIMLT.

WOLVERHAMPTON
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D	*I. A. Harper, MB, MRCPath.
C	R. G. Thompson, MRCS, MRCPath.
HT	J. Leek, FIMLT.

WORCESTER
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D	R. J. Henderson, MD.
M & S	M. B. Skirrow, MB, PhD, MRCPath, DTM & H.
HT	H. R. Jenkins, FIMLT.

Staff on Secondment

M. W. D. Buxton, FIMLT (*to Clinical Infectious Disease Unit, Pahlavi University, Shiraz, Iran*)

K. T. Crane, FIMLT (*to the Medical Research Council Laboratories, Fajara, The Gambia*)

D. B. McGechie, MB, MRCS, MRCPath, Dip.Bact. (*to Hong Kong Government Medical and Health Department*)

R. T. Mayon-White, MB, MRCP (*to Medical Research Council, Trinidad*)

Miss Susan E. J. Young, BA, MB, MRCP, BAO, DCH, Dip.Bact. (*to the North West Thames Regional Health Authority*)

* Honorary Consultant Microbiologist Director employed by the West Midlands Regional Health Authority.

Consultant Microbiologists in University and Area Health Authority Laboratories holding honorary contracts with the Public Health Laboratory Service Board

(This list omits consultants working in Public Health Laboratory Service laboratories and included in the Directory, pp. 8–19)

J. F. ARCHER, MD, MRCPath, Dip.Bact.
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R. BLOWERS, MD, FRCP, FRCPath, Dip.Bact.
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W. M. EDGAR, MA, MD, FRCPath.
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Simms Woodhead Memorial Laboratory, Papworth Hospital, Papworth Everard, Cambridge.
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M. W. N. NICHOLLS, MB, MRCS, MRCPath.
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and Department of Microbiology, Worthing Hospital, Worthing.
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M. SEVERN, MB, MRCPath.
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Mrs. E. JOAN STOKES, MB, FRCP, FRCPath.
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J. M. TALBOT, MD, MRCPath, Dip.Bact.
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W. R. G. THOMAS, MB, MRCS, MRCPath, DTM&H, Dip.Bact.
Bacteriology Laboratory, Mayday Hospital, Mayday Road, Thornton Heath, Surrey, CR4 7YE.
Tel. 01-684 6999.

R. FRASER WILLIAMS, MB, MRCPath.
Department of Pathology, Monsall Hospital, Newton Heath, Manchester, M10 8WR.
Tel. 061-205 2254.

All regional and many area laboratories of the PHLS undertake routine tests for the diagnosis of virus infections, the serological diagnosis of leptospiral infections, and for the phage typing of *Staphylococcus aureus*. Many undertake serological tests for HBAg.

Reference laboratories undertake work as indicated by their title. Other facilities are available at reference, regional or area laboratories of the PHLS or are provided by workers in hospital or university laboratories, as listed below. For addresses and telephone numbers of PHLS laboratories, the directory section (pp. 8–19) should be consulted. Individual micro-organisms and diseases are given in the index of facilities offered. For the identification of miscellaneous bacteria for which no specific reference facility is listed, the Curator of the National Collection of Type Cultures should be consulted.

It is suggested that in the first instance enquiries regarding special tests or facilities should be addressed to the nearest PHLS laboratory.

Amoebiasis, diagnosis of

A. L. Jeanes, MD, FRCPath, Department of Microbiology, Guy's Hospital Medical School, London, S.E.1. *Tel.:* 01-407 7600, *Ext.* 3376

W. P. Stamm, Air Vice-Marshal, CBE, FRCP, FRCPath, St. Giles' Hospital, St. Giles' Road, Camberwell, London, S.E.5. *Tel.:* 01-703 4221, *Ext.* 117.

Anaerobes, identification

Luton PHLS Laboratory.

Anthrax bacilli, identification

Guildford PHLS Laboratory.

Anthrax, examination under Wool and Hair Regulations

Guildford, Leeds, Liverpool PHLS Laboratories.

T. F. Elias-Jones, MB, FRCPath., The City Laboratory, 23 Montrose Street, Glasgow, G1 1RN. *Tel.:* 041-221 9600 and 4348, *Ext.* 2400.

Arboviruses

J. S. Porterfield, MD, LRCP, MRCS, National Institute for Medical Research, Mill Hill, London, NW7 1AA. *Tel.:* 01-959 3666.

Arizona group, identification

Salmonella and Shigella Reference Laboratory (Colindale).

Brucella, identification

Portsmouth PHLS Laboratory.

Cholera and related vibrios, Aeromonas and Plesiomonas

Maidstone PHLS Laboratory.

Vibrio cholerae, additional facilities

Stoke PHLS Laboratory.

Clostridium welchii, serological typing

Food Hygiene Laboratory (Colindale).

Coxsackie A viruses

Epsom PHLS Laboratory.

Cytomegaloviruses

Professor H. Stern, MB, PhD, FRCPath, Dept. of Medical Microbiology, St. George's Hospital Medical School, Hyde Park Corner, London, S.W.1. *Tel.:* 01-235 5835.

Cytomegaloviruses, regional centres for complement fixation tests

Bristol, Leeds, Manchester PHLS Laboratories, Virus Reference Laboratory (Colindale).

Diphtheria bacilli, identification of

Swansea PHLS Laboratory.

I. Zamiri, MD, MRCS, Dept. of Medical Microbiology, the Welsh National School of Medicine, Heath Park, Cardiff, CF4 4XN. *Tel.:* Cardiff (STD 0222) 755944.

Drug resistance in Enterobacteria

Enteric Reference Laboratory (Colindale).

Entomological specimens, investigation

B. R. Laurence, PhD, Department of Entomology, London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT. *Tel.:* 01-636 8636.

Escherichia coli, typing

Salmonella and Shigella Reference Laboratory (Colindale).

Farmer's lung, serological diagnosis

Mycological Reference Laboratory (London School of Hygiene), Carlisle, Carmarthen, Exeter, Taunton, Truro PHLS Laboratories.

J. H. Edwards, BSc, PhD, Pneumoconiosis Research Unit, Llandough Hospital, Nr. Penarth, Glam. *Tel.:* Cardiff (STD 0222) 708761.

D. M. Weir, MD, Immunology Laboratory, Department of Bacteriology, Edinburgh University Medical School, Teviot Place, Edinburgh. *Tel.:* 031-667 1011, *Ext.* 2256.

Fungi (*pathogenic*), identification and serological diagnosis

Mycological Reference Laboratory (London School of Hygiene).

Helminthological specimens, investigation

Professor G. S. Nelson, MD, DSc, MRCP, DTM & H, DAP & E, London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT. *Tel.:* 01-636 8636.

Hydatid disease, complement-fixation test

Standards Laboratory for Serological Reagents (Colindale).

Immunofluorescence

PHLS Laboratory, Central Middlesex Hospital.

Influenza

Virus Reference Laboratory (Colindale).

Listeria, typing

Standards Laboratory for Serological Reagents (Colindale).

Malaria, diagnosis See *Protozoa*

Meningococci, typing and tests for sulphonamide sensitivity

Standards Laboratory for Serological Reagents (Colindale).
Manchester PHLS Laboratory.

Parasitic infections, serological diagnosis of

D. S. Ridley, BSc, MD, FRCPath, Department of Pathology, Hospital for Tropical Diseases, 4 St. Pancras Way, London, NW1 0PE. *Tel.:* 01-387 4411. (Tests available for *Chagas' disease*, *Cysticercosis*, *Fascioliasis*, *Filariasis*, *Kala azar*, *Schistosomiasis*, *Trichinosis*)

Pneumococci, typing of, from epidemics

Cross-Infection Reference Laboratory (Colindale).

Poliomyelitis, marker tests

Virus Reference Laboratory (Colindale).

Poxvirus, animal virus related to smallpox

Professor K. R. Dumbell, MD, Department of Virology, St. Mary's Hospital Medical School, Paddington, London, W2 1PG. *Tel.:* 01-723 1252.

Protective cabinets

Cross-Infection Reference Laboratory (Colindale).

Protozoa of the blood, tissues and intestine, including malaria

Professor W. H. R. Lumsden, DSc, MB, FRCPE, FIBiol, FRSE, Department of Medical Protozoology, London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT. *Tel.:* 01-636 8636.

Psittacosis, isolation of causative agent

Virus Reference Laboratory (Colindale).

Rabies, laboratory tests for diagnosis

Virus Reference Laboratory (Colindale).

Rickettsia

Cardiff PHLS Laboratory.

Sexually transmitted diseases, treponemal immobilisation test

V.D. Reference Laboratory (London Hospital), Newcastle PHLS Laboratory.

P. J. L. Sequiera, MB, the Central Serological Laboratory, Withington Hospital, West Didsbury, Manchester, M20 8LR. *Tel.:* Manchester (STD 061-445) 7683.

Shigella sonnei, confirmation and typing

Guildford PHLS Laboratory.

Smallpox, laboratory tests for diagnosis

Bristol, Cardiff, Leeds, Newcastle PHLS Laboratories, Virus Reference Laboratory (Colindale).

Birmingham: H. S. Bedson, MD, MRCP, Department of Virology, The University, Birmingham, B15 2TJ. *Tel.:* 021-472 1301. *Night extension:* 021-472 3524.

Liverpool: Professor K. McCarthy, MD, FRCPath, Department of Medical Microbiology, New Medical School, University of Liverpool, P.O. Box 147, Liverpool, L69 3BX. *Tel.:* 051-709 6022, *Ext.* 202. *Night extension:* 051-722 5560.

Staphylococcal enterotoxin, typing

Food Hygiene Laboratory (Colindale).

Staphylococci, bacteriophage-typing techniques and reagents

Cross-Infection Reference Laboratory (Colindale).

Streptococci of Group A, typing

Regional Typing Laboratories

London and Southern Counties: Cross-Infection Reference Laboratory (Colindale)

Northern Counties: Leeds PHLS Laboratory

Eastern Counties: Cambridge PHLS Laboratory

Western Counties: Oxford PHLS Laboratory

Wales: Cardiff PHLS Laboratory.

Streptococci of Groups B and D, typing; *other Streptococci*, identification

Cross-Infection Reference Laboratory (Colindale).

Toxocariasis

Professor A. W. Woodruff, MD, PhD, FRCP, DTM&H, Department of Clinical Tropical Medicine, London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT. *Tel.:* 01-686 8636.

or

Hospital for Tropical Diseases, 4 St Pancras Way, London, NW1
Tel.: 01-387 4411, *Ext.* 147.

Toxoplasmosis

North: Leeds PHLS Laboratory
South (excluding London): Swansea PHLS Laboratory
London: PHLS Laboratory, St. George's Hospital, Tooting.

Trichinosis, examination of rats and pigs

Professor G. S. Nelson, MD, DSc, MRCP, DTM&H, DAP&E, London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT. *Tel.:* 01-636 8636.

Tubercle bacilli and other mycobacteria

Tuberculosis Reference Laboratory, Cardiff

Regional Centres for Tuberculosis Bacteriology

Birmingham, Leeds, Liverpool, London (Dulwich), Manchester, Newcastle PHLS Laboratories.

Typhus fever, serological tests*

Virus Reference Laboratory (Colindale).

Venereal Diseases: see sexually transmitted diseases.

Vibrio parahaemolyticus

Truro PHLS Laboratory.

Yersinia pseudotuberculosis and *Yersinia enterocolitica*

Leicester PHLS Laboratory.

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* 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 OTHER IMMUNOLOGICAL MATERIALS OBTAINABLE THROUGH THE PUBLIC HEALTH LABORATORY SERVICE

The Hospital Pathological Service, and other sources

**Rabies Vaccine and Antiserum*

Stocks are held by the PHLS laboratories at:

Cardiff
Liverpool
London (Colindale)
Newcastle

Anthrax Vaccine

Stocks are held by the PHLS laboratories at:

Cardiff
Leeds
Liverpool
London (Colindale)

Issues of immunoglobulin

Human normal immunoglobulin is prepared from pools of human plasma. It is distributed by PHLS laboratories, on behalf of the Department of Health and Social Security, mainly for the prophylaxis of infectious hepatitis and rubella.

Human specific immunoglobulins are prepared from convalescent or recently immunized donors, and contain increased amounts of the specified antibody.

Human anti-vaccinia immunoglobulin is used for the treatment of generalised vaccinia, eczema vaccinatum, accidental vaccine injections and, in special circumstances, for prophylaxis in unvaccinated smallpox contacts. Small stocks are available at the following PHLS laboratories:

Birmingham	Gloucester	London (Colindale)	Oxford
Bristol	Leeds	Manchester	Plymouth
Cambridge	Leicester	Newcastle	Reading
Cardiff	Liverpool	Norwich	Sheffield

Human anti-varicella zoster immunoglobulin is used for the prevention of chickenpox and the treatment of serious cases. Small stocks are sometimes available from the Epidemiological Research Laboratory, Colindale.

Human anti-mumps immunoglobulin is used for the treatment of contacts in whom an attack of mumps would be dangerous. Small stocks are sometimes available from the Epidemiological Research Laboratory, Colindale.

Human anti-HBAg immunoglobulin is prepared from blood donors found to have antibody on routine screening. A small stock is held at Colindale for issue in the MRC clinical trial for prophylaxis after inoculation accidents.

Human immunoglobulin to reduce reactions to *measles vaccine* is not distributed by the PHLS. Stocks are held by local health authorities.

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* Urgent requests for rabies vaccine or antiserum and anti-vaccinia human immunoglobulin only are received at any time at the Central Public Health Laboratory, Colindale.

Material for intradermal diagnostic tests

Kveim antigen for sarcoidosis and cat scratch fever antigen can be obtained from the PHLS Standards Laboratory.

Enquiries relating to fungal antigens should be addressed to the PHLS Mycology Reference Laboratory.

Yellow fever inoculation

A list of centres can be obtained from the Department of Health and Social Security, Alexander Fleming House, Elephant and Castle, London, S.E.1.

TABC, cholera, typhus and other vaccines

Most of these are available commercially.

Smallpox Vaccine

Obtainable from Local Health Authorities.

Antisera for therapeutic use

Obtainable through the Hospital Pathological Service.

(a) anthrax antiserum
(b) botulinum antitoxin
(c) human antitetanus immunoglobulin
(d) ovine antitetanus serum

Note: L = Pathology Laboratory
P = Pharmacy

Northern RHA

L	Carlisle, Cumberland Infirmary	abcd
P	Newcastle, General Hospital	abcd
	Catterick, OC Military Hospital	c

Yorkshire RHA

P	Hull, Castle Hill Hospital	abcd
P	Leeds, Seacroft Hospital	abcd

Trent RHA

P	Nottingham, City Hospital	abcd

East Anglia RHA

	Cambridge, Director, Regional Transfusion Centre	abcd

North West Thames RHA

P	Edgware, General Hospital	bcd

North East Thames RHA

L	London N18, North Middlesex Hospital	abcd
P	London N7, Royal Northern Hospital	a
	Colchester, OC Military Hospital	c

South East Thames RHA

P	Tunbridge Wells, Kent and Sussex Hospital	abcd

South West Thames RHA

	Tooting: Director, South London Transfusion Centre, 75 Cranmer Terrace SW17	abcd
P	Epsom District Hospital	b

Wessex RHA

P	Southampton, General Hospital	abcd
P	Salisbury, Odstock Hospital	a
	Salisbury, Officer-in-Charge, Accident Department, General Hospital	cd
L	Dorchester, Director, Public Health Laboratory	cd
P	Portsmouth, Royal Portsmouth Hospital	cd
	Aldershot, OC Cambridge Military Hospital	c

Oxford RHA

L	Northampton, General Hospital	abcd
P	Reading, Royal Berks, Hospital	abcd
P	Oxford, Churchill Hospital (day only)	c
P	Oxford, Radcliffe Infirmary (day only)	d

South Western RHA

P	Bristol, Ham Green Hospital	abcd
P	Exeter, Royal Devon and Exeter Hospital (Wonford)	abcd
	Plymouth O i/c Accident Department, General Hospital, Freedom Fields	abcd
P	Truro, Royal Cornwall Hospital, Treliske Branch	abcd

West Midlands RHA

P	Shrewsbury, Royal Salop Infirmary	acd
P	Birmingham 29, Selly Oak Hospital	abcd
P	Stoke-on-Trent, North Staffs Royal Infirmary	acd

Mersey RHA

P	Liverpool 9, Walton Hospital	abcd

North Western RHA

P	Manchester, Royal Infirmary	

Wales

P	Cardiff, Royal Infirmary	abcd
P	Bangor, Caernarvon and Anglesey General Hospital	abcd
P	Wrexham, Maelor General Hospital	abcd
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REPORT OF THE DIRECTOR FOR 1974

1974 was the year in which the administrative reorganization of the National Health Service and of local government took effect and, although the administration of the Public Health Laboratory Service was not altered by the new Acts, the work of our laboratories was necessarily affected. The links that had been developed over many years between laboratory directors and Medical Officers of Health had to be replaced by new links with the Medical Officers for Environmental Health and the Chief Environmental Health Officers. For much of the year these officers were themselves in the situation of having to develop new links and new ways of working. There were inevitably some interruptions in the routine of bacteriological sampling of food, and some problems in the exchange of information on infective disease. The directors of PHLS laboratories were encouraged to arrange meetings at which they could discuss the programme for public health microbiological work with the local Chief Environmental Health Officers, and to define the lines of communication with the medical officers concerned with health in the new local authority areas; by the end of the year the liaison was working well in almost all areas.

The oil crisis led, early in 1974, to an acute shortage of plastics and in particular many laboratories had great difficulty in obtaining adequate supplies of the disposable plastic petri dishes that have, in recent years, almost entirely displaced the traditional glass dishes. PHLS laboratories use some 6 million plastic dishes in a year. The problem was overcome in a variety of ways: it provided a stimulus to greater discipline in the request and selection of specimens for examination and of the laboratory methods used; it stimulated investigation into ways in which plastic dishes could safely be re-used; and it brought glass dishes into use in laboratories fortunate enough to have adequate stocks of them, and (a major constraint) adequate facilities for washing them.

In the event, the number of specimens examined in PHLS Regional and Area laboratories during 1974 was reported as 4,554,000 (Table 1), a slight decrease on that for 1973.

At the end of the year there were a total of 56 regional and area laboratories, and 17 reference and special laboratories; the medical, scientific and technical staff numbers are shown in Table 2. The estimated expenditure for the calendar year 1974, including capital, was in the region of £7.2 million.

In most areas, about 66 per cent of the specimens sent to PHLS laboratories come from hospital patients; about 22 per cent are from general practitioners and the remainder are sent for routine monitoring of food, milk, water, or other environmental reservoirs of infection, or are from persons investigated in the course of epidemiological studies.

Table 1

Number of Specimens Examined in Regional and Area Laboratories, 1974
(*to nearest* 1,000)

Source	Examination required	Number of specimens
Humans	Isolation of bacteria	3,028,000
	Isolation of viruses	79,000
	Detection of antibody for:	
	sexually-transmitted disease	454,000
	other bacterial infection	99,000
	rubella	308,000
	other viral infection	129,000
	Detection of HB Ag	116,000
Animals	Various	6,000
Food and drink	Milk, cream	81,000
	Ice-cream	17,000
	Shell-fish	4,000
	Other food	29,000
	Drinking water	103,000
Other sanitary and environment	Bathing water	23,000
	Other	78,000
	TOTAL	4,554,000

Table 2

Number of Staff in Post

Category	Regional and Area Laboratories	Reference and Special Laboratories	Total
Medical	132	28	160
Scientific	28	72	100
Technical	661	92	753

Statistics for the workload of the 16 reference laboratories are not presented this year since they are, as indicated in the report for 1973, very difficult to derive meaningfully from the numbers of specimens received. The reference laboratories have, however, continued to provide the special diagnostic facilities essential for proper investigation of the epidemic or endemic prevalence of infection, as well as carrying out important research studies.

The collation of the results of microbiological examinations of material from patients is the function of the Epidemiological Research Laboratory, which gathers routine results from PHLS and hospital laboratories in the weekly Communicable Disease Report, and which supplements this information with various special projects. The next section of this report illustrates the information gathered by recounting some of the more interesting features of microbial disease noted in 1974.

The Communicable Disease Report is only one of many ways in which the PHLS participates in collaborative studies to monitor the prevalence and character of microbial infections in England and Wales. In this year's report chief emphasis is given to activities involving co-operative work by groups of PHLS laboratories, or by PHLS laboratories and others.

COMMUNICABLE DISEASE REPORT: SPECIAL FEATURES IN 1974

The number of reports from which the Communicable Disease Report (CDR) is compiled is large—there were over 20,000 virus returns alone in 1974—and it is possible to mention only a few of their epidemiological aspects. Influenza, respiratory syncytial virus, adenovirus type 7, echovirus type 19, all exhibited features of special interest. Among the bacterial infections, *Bordetella pertussis*, *Neisseria meningitidis* and *Brucella abortus* have been included.

Virus infections

Influenza. Many viruses exhibit pronounced changes in prevalence from year to year together with seasonal variations. 1974 began with an outbreak due to influenza B which showed two striking epidemiological features. First, reports of influenza B were more numerous than in any previous recorded year. The number of reports may, of course, be affected by an increasing interest in the disease; nevertheless their number suggests that the 1974 outbreak was much larger than those of any recent year. Second, the outbreak appeared much earlier in the year than is usual; characteristically influenza B is an infection of late spring and early summer (Fig. 1).

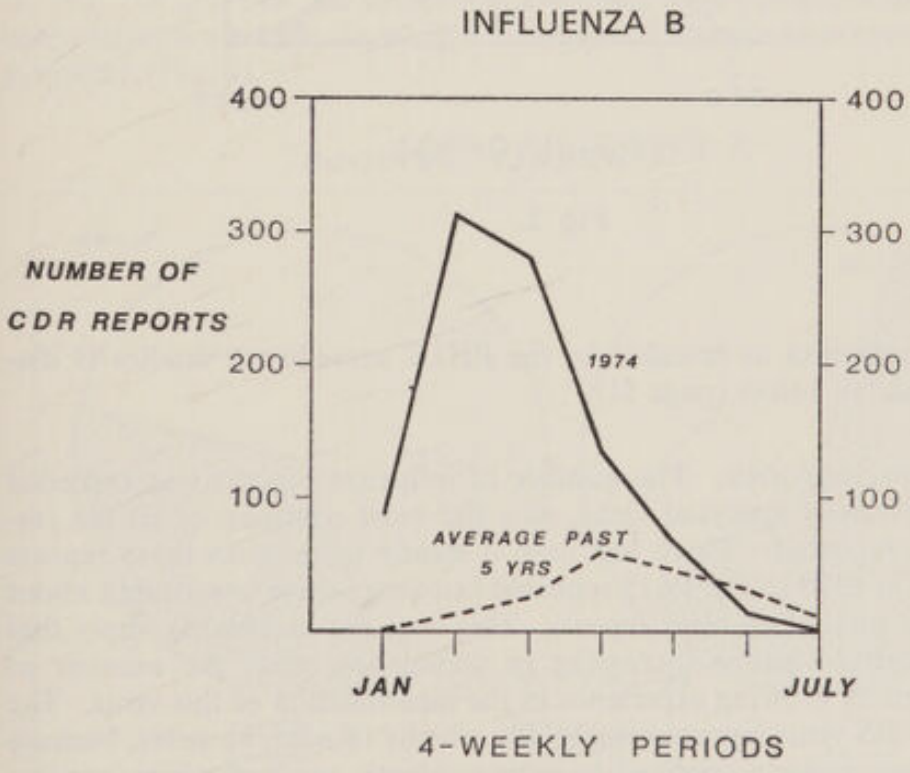

Fig. 1.

During the outbreak symptoms were sometimes severe, and in some communities, such as camps and boarding schools, a substantial proportion of the susceptibles were affected. In a Royal Air Force camp, 257 of 886 persons developed symptoms and more than 100 required admission to the medical centre, while in a preparatory boarding school no less than 317 of 440 boys (72 per cent) were ill.

Another feature of 1974 was an outbreak due to influenza A which, in contrast to the influenza B outbreak, appeared later than usual (Fig. 2).

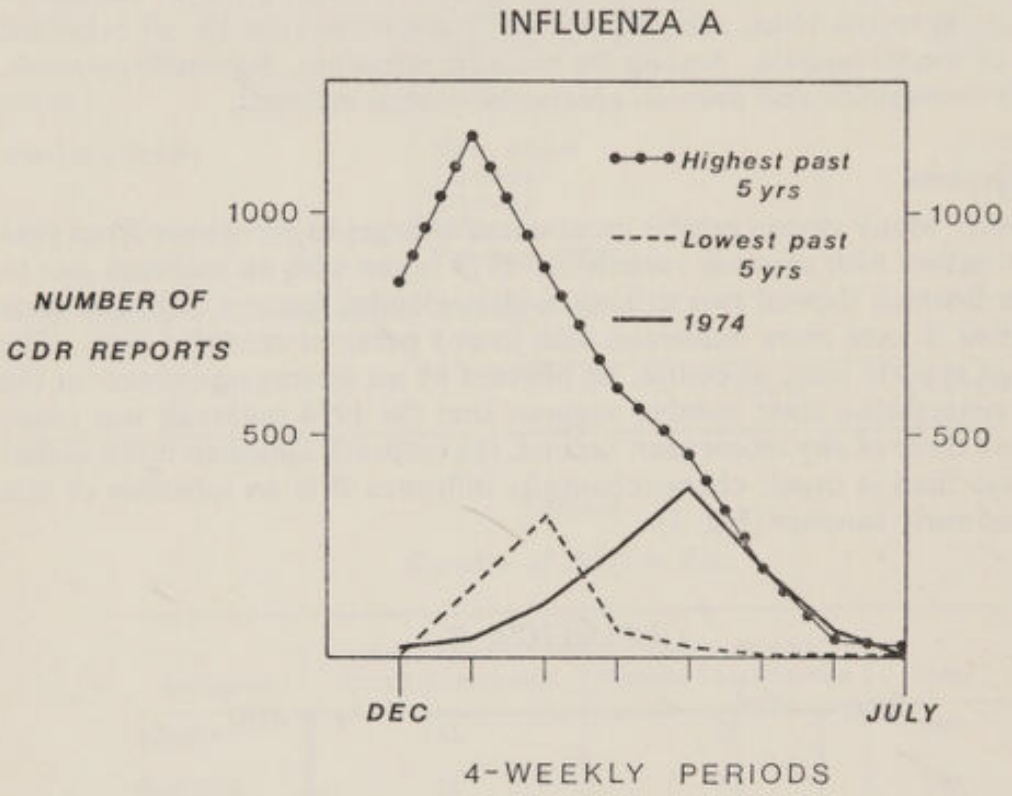

Fig. 2.

The pattern of influenza as revealed by the PHLS surveillance studies is discussed in more detail below (page 51).

Respiratory syncytial virus. The number of influenza reports was exceeded by those of respiratory syncytial virus, now the most common of all the respiratory viruses reported. There has been a steady increase in these reports from about 580 in 1970 to the 1,515 reported last year; these constituted about 9 per cent of the total of all virus reports. This does not necessarily imply that respiratory syncytial virus is increasing in prevalence, since the number of reports is affected by growing experience in the identification of this virus. The large number of RS virus reports is especially worthy of note, however, because infection is almost entirely confined to young infants, most of whom are less than six months old (Fig. 3).

R S VIRUS

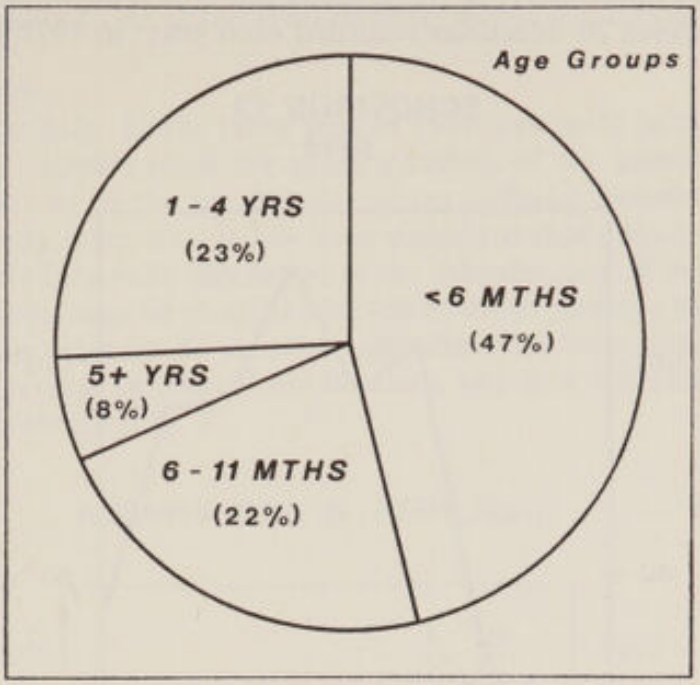

Fig. 3.

Adenovirus Type 7. The respiratory infections that occurred in the early part of the year were followed by an increase in prevalence of another respiratory infection—due to adenovirus type 7—which reached its peak in mid-summer. In 1974 type 7 infections were reported more frequently than in any other recorded year—721 reports as compared with the average for the last five years of 182. In children the symptoms recorded were predominantly respiratory; conjunctivitis was rare. In adults conjunctivitis was the most commonly recorded symptom (Fig. 4).

ADENOVIRUS TYPE 7

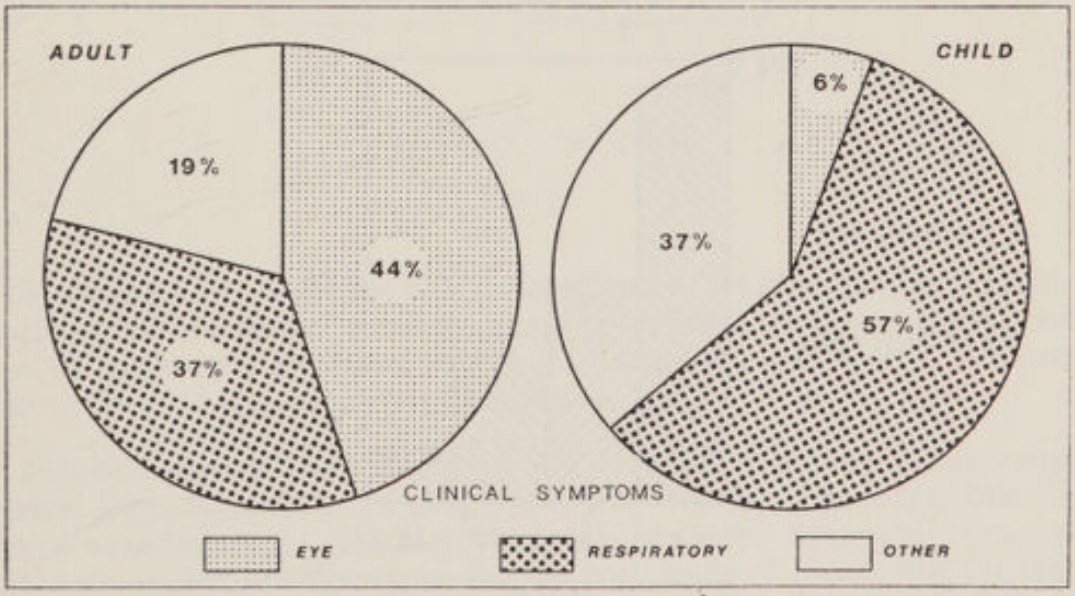

Fig. 4.

Echovirus Type 19. Summer and autumn were marked by an outbreak of echovirus type 19 infections (Fig. 5). Usually this type is uncommon; on average there are only about 20 infections recorded each year; in 1974 there were 566.

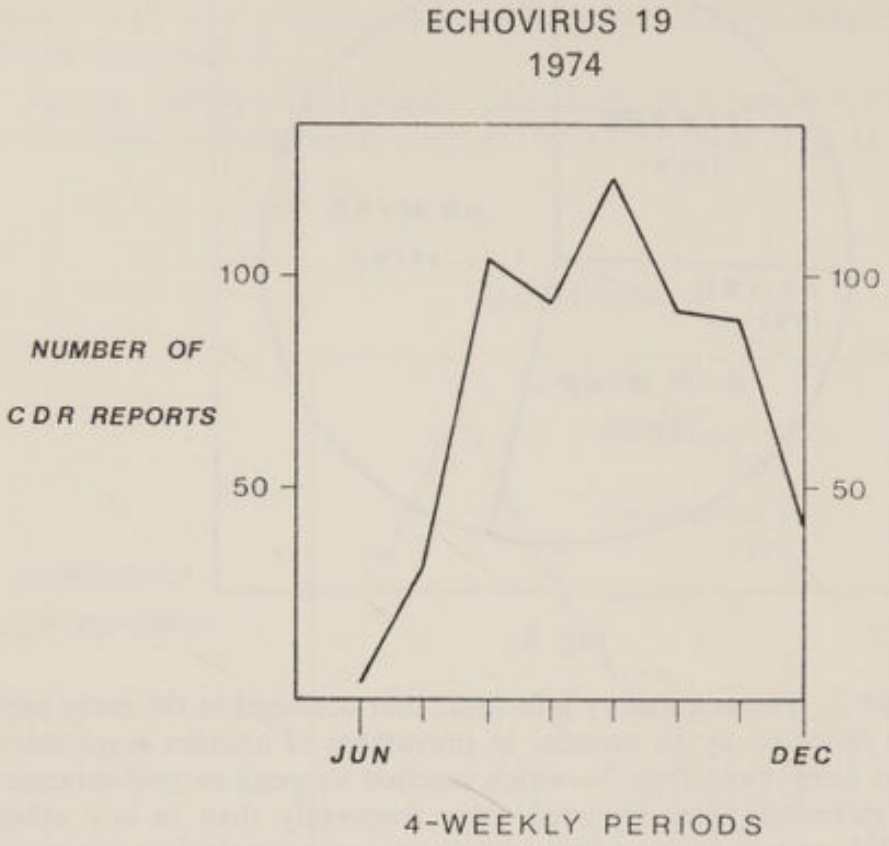

Fig. 5.

Both adults and children were affected, but the rate appeared to be especially high in young children (Fig. 6).

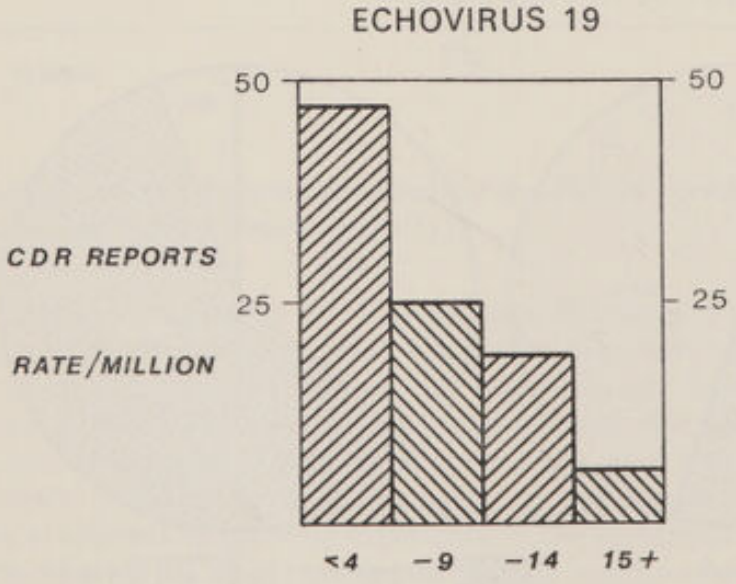

Fig. 6.

About 60 per cent of the symptoms recorded were those of meningitis, but this proportion must be influenced by the fact that patients with meningitis may be more likely to be tested than patients whose symptoms are less severe.

Bacterial infections

Bordetella pertussis. In the latter part of 1974 reports of isolations of *B. pertussis* began to increase from the small numbers of the previous three years. This rise appears to be the most recent of the periodic increases that occur at about three-yearly intervals. It has been suggested that whooping cough notifications may not be a valid indication of the prevalence of *B. pertussis* infection since the symptoms may be produced by some viruses, notably the adenoviruses. However, the increase in *B. pertussis* identifications occurred over the same period as the increase in clinical notifications and at a different time from the adenovirus prevalence (Fig. 7).

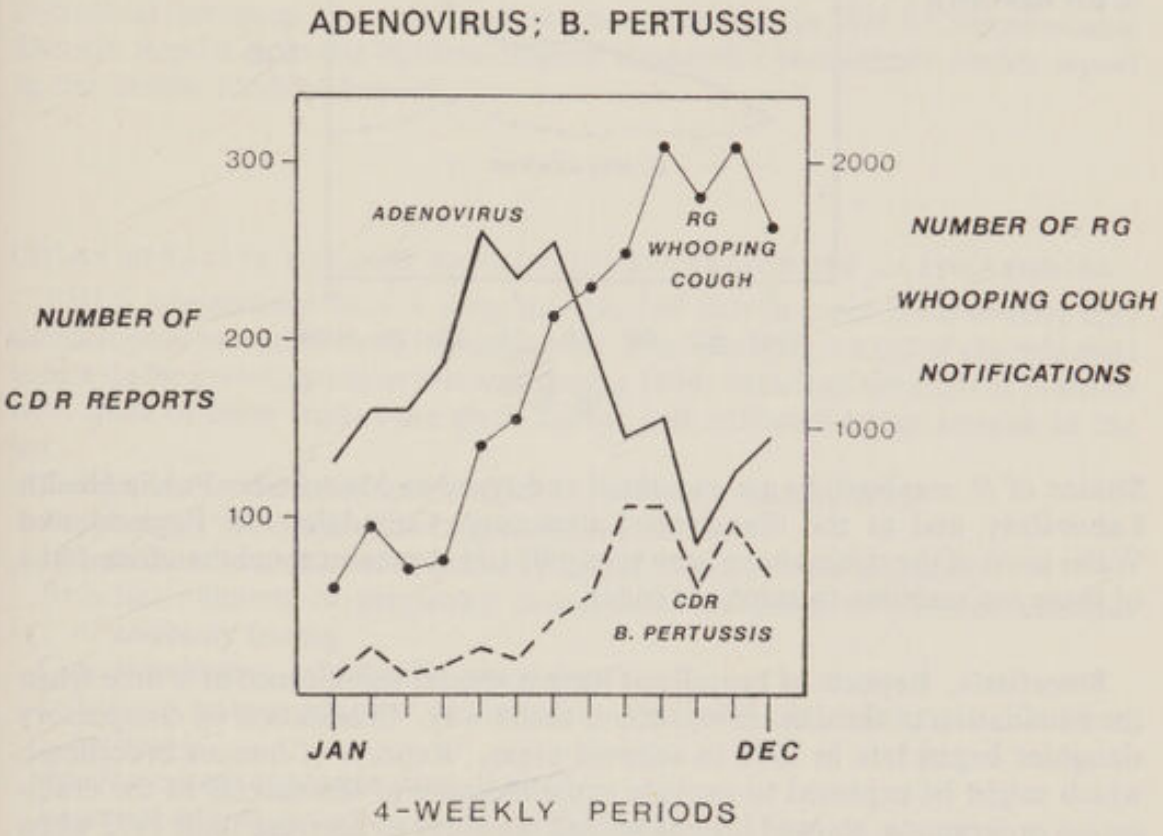

Fig. 7.

The controversy about the safety and efficacy of pertussis vaccine is probably reducing the number of children immunized against whooping cough, and it will be particularly important to note the number of isolations of *B. pertussis* during the next whooping cough outbreak.

Neisseria meningitidis. Meningococcal meningitis has been increasing in several European countries during recent years and in 1974 a large outbreak in Brazil attracted special attention. As far as the United Kingdom is concerned, the main factors of importance are the prevalence of meningitis, the strains responsible for disease, and their sensitivity to sulphonamides which in turn

affects prophylaxis in contacts. In each year since 1967 there has been an increase in the number of reports of meningococcal meningitis in the United Kingdom, especially during the last few years. In contrast, reports of meningitis due to *Haemophilus influenzae* have shown no increase (Fig. 8).

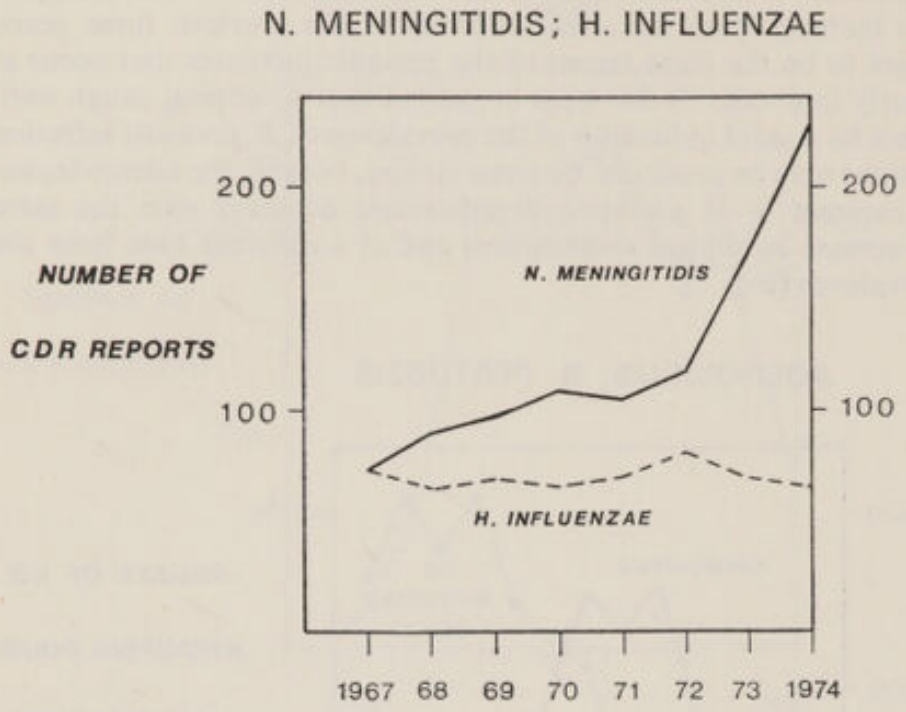

Fig. 8.

Strains of *N. meningitidis* are examined and typed at Manchester Public Health Laboratory and at the Standards Laboratory, Colindale. In England and Wales most of the strains have been group B, and at present more than four-fifths of them are sensitive to sulphonamides.

Brucellosis. Reports of brucellosis have a special significance at a time when the elimination of the disease in cattle is under way. Eradication by compulsory slaughter began late in 1971 in selected areas. Reports of human brucellosis, which might be expected to provide some measure of the success of the eradication programme, showed little sustained tendency to decrease until 1973 when they declined from the previous year's 298 to 217. In 1974 there was a further substantial decline of a quarter, to 162. It is too early to say whether the reduction in reports is due to successful eradication, but clearly the returns will be of special interest during the next few years.

Outbreaks of infection

As in other years, 1974 was punctuated by outbreaks. Food-poisoning outbreaks due to salmonellas, *Clostridium welchii* and staphylococci were reported; some of these were large. One hundred and fifty persons on one occasion and more than 200 on another became ill after eating turkey infected with *Salmonella typhimurium*. The dangers of raw milk were emphasized when 200 students

developed salmonellosis (*S. anatum*; *S. agona*), apparently from this source. Nearly 400 patients in a mental hospital, who ate reheated mince, became ill due to infection with *Cl. welchii*. Full details of the food-poisoning outbreaks will be published later.

There were other more unusual outbreaks. A factory installed an orange-drink vending machine for their employees. Most of those who drank from it on the first day became ill and the PHLS identified *Escherichia coli* and *Salmonella agona* in the water supply. Unpurified river water instead of mains water had been connected to the machine. In another outbreak cases of facial infection due to herpes simplex virus occurred among opposing forwards after a game of rugby. At least 150 isolations of *Giardia lamblia* were reported from many different areas, in all cases from patients who drank water or unbottled soft drinks in Leningrad.

There are other outbreaks, too numerous to describe here. Outbreaks and individual infections of special interest are included in the PHLS Communicable Disease Report or in the Epidemiological Research Laboratory's weekly report in the *British Medical Journal*.

COLLABORATIVE STUDIES INVOLVING SEVERAL PHLS LABORATORIES

PHLS laboratories have a long tradition of carrying out collaborative epidemiological and laboratory investigations. The following is a list of the principal topics under investigation in this way during 1974; details of the current position with some of these studies are given below, and indicated by an asterisk in the list.

Influenza: surveillance, and studies in families*; vaccine trials
Respiratory syncytial virus infections in children*
Hepatitis: in dialysis units*; anti-HB Ag for inoculation accidents*
Rubella: outcome of pregnancy complicated by infection*; standardization of antibody testing
Cytomegalovirus infection in pregnancy*
Infectious mononucleosis: in university students*; in relation to EB virus antibody
Bacillus cereus contamination of rice*
Bacterial counts as indicators in food hygiene
Use of methylene blue test for milk
Revised methods for testing for *Escherichia coli* in water
Prevalence of *Vibrio parahaemolyticus* in sea-water and sea-food
Study of the value of microbiological laboratory reports*

Influenza surveillance

Current PHLS studies into the epidemiology of influenza are of importance not only because epidemic influenza often has such serious effects in Britain, but also because influenza is going through a particularly interesting phase. In the short space of three years the A/Hong Kong/1/68 (H_3N_2) sub-type of influenza A virus, which appeared in 1968, has undergone two further variations (drifts) in antigenic structure, each large enough to require manufacturers to

alter the composition of their vaccines. These changes are represented by the strains A/England/42/72 and A/Port Chalmers/1/73. In late 1974 a further variant appeared in Scotland and has since caused influenza in England and Wales—the A/Scotland/840/74 strain. Changes in the influenza B virus have also occurred during this period. Research into the fundamental biology and chemistry of the influenza virus has allowed a better appreciation of the nature of these changes, but an understanding of their epidemiological effects requires field studies of the sort in which the PHLS is engaged.

The influenza surveillance study, which was referred to in the 1973 report, continued in 1973–74, and is now being supplemented and extended by a second collaborative investigation made jointly between the PHLS and the Royal College of General Practitioners—the 'Family Influenza Study'. The latter investigation involves close clinical and serological supervision of volunteer patients by their family doctors and by PHLS virologists.

At the beginning of the winter of 1973–74 the population was exposed to the new influenza A variant, A/Port Chalmers/1/73 (H_3N_2) and to the new B variant, B/Hong Kong/5/72. Serological evidence indicated that about 90 per cent of the population might be regarded as susceptible to influenza A and a similar proportion to influenza B. Despite this high susceptibility relatively little influenza developed in the country. The findings of both PHLS studies indicated that only about 2 to 4 per cent of the population had a clinical attack of influenza severe enough for them to consult their doctor—about half due to the A and half due to the B virus. Not only did the new B virus fail to cause much influenza, but a good proportion of that which did occur was caused by a strain intermediate in its antigenic structure between the new and the older strains (B/England/848/73). Serological findings from the Family Influenza Study suggested that a further 9 per cent or so of the population had evidence of subclinical influenza A and 7 per cent of subclinical influenza B infection. The distribution of the virus in England and Wales, particularly influenza B, appears to have been patchy; some areas probably had little or no influenza (e.g. Carlisle, Nottingham, Salisbury) and others experienced small outbreaks (influenza A in Bath, Derby and Shrewsbury and influenza B in Bath and Gloucester). More outbreaks than usual were recorded in residential schools, a situation that might be expected when new antigenic variants make their appearance.

It is evident that antigenic changes in the influenza virus, apparently large enough to overcome the pre-existing population immunity as indicated by measures of circulating antibodies, do not suffice to cause epidemic influenza. Other possible contributory factors require to be examined, air temperature and humidity, for example, and further studies into the factors determining the virulence of influenza viruses are also necessary.

A feature of the 1973–74 winter was the high excess mortality (i.e. excess over that expected in the absence of influenza), as compared with the relatively few deaths certified as due to influenza or influenzal pneumonia. The possibility is indicated by this observation that new antigenic variants of influenza viruses may lead to an unusual number of deaths in old persons, despite a small effect in the population as a whole. This question requires further study, but it suggests that a serious effort to immunise older persons in years when a fresh antigenic variant appears may be rewarding even in the absence of a large epidemic.

Respiratory-syncytial (RS) virus infections

Respiratory-syncytial virus is now recognized as the most common agent isolated from young children with acute respiratory tract illness, especially bronchiolitis (see page 46). Seven PHLS laboratories are participating in a collaborative study organized by a Medical Research Council committee under the chairmanship of Professor P. S. Gardner to determine the incidence of infection with RS virus in children admitted to hospital with severe respiratory tract infections, and to compare the frequency of the infection in those from rural and urban areas and conurbations. So far the study has continued for only one year and has been concerned mainly with establishing virological methods and recording systems, but there is an indication that the infection is indeed more frequent in young children living in conurbations than in those from other urban, or from rural, areas. This study will provide valuable information on which to base advice for prevention of this common, and occasionally fatal, infection in young children.

Hepatitis

Hepatitis in the patients and staff of dialysis units has been studied by the Virus Reference Laboratory and the Epidemiological Research Laboratory since 1968 and an analysis of four years' experience has recently been completed. In the first two years of the survey there was a three-fold rise in incidence, and there seemed a serious risk that the rise would continue, as indeed it has in several other countries. The availability of laboratory tests for HB Ag (Australia antigen) made possible the institution of preventive programmes. These included monitoring for HB Ag carriage of all staff and patients, the transfer of antigen-positive patients to isolation or to home dialysis, improved precautions against cross-infection and regular testing for HB Ag of blood used for transfusion. Twenty-eight of the 43 dialysis units in the United Kingdom were included in the survey in 1970, 1971 and 1972, and the incidence of HB Ag-associated hepatitis among patients fell from 10·1 per 100 persons a year at risk in 1970 to 6·4 in 1971, and 2·8 in 1972; the incidence rates in staff were 2·3, 1·1 and 0·6 respectively. Although part of the success of this programme must derive from the introduction of routine testing for HB Ag of all blood used for transfusion, much must also be attributed to the surveillance of the carriers and the general hygienic precautions; in some other countries hepatitis is still common in dialysis units despite regular testing of all blood used for transfusion. The importance of regular monitoring of patients derives from the fact that patients with chronic renal disease develop immunological abnormalities that can lead to asymptomatic HB Ag carriage before renal failure develops. The frequency of HB Ag carriers in the dialysis unit populations is thus likely to be higher than in the general population; and, since patients on long-term haemodialysis live at home, they are exposed to infection from sources other than transfusion.

The success in controlling infection in the dialysis units demonstrates the benefit that clinicians can derive from epidemiologists who have strong links with the relevant laboratory.

Many public health laboratories, and some hospital laboratories, now carry out routine tests for HB Ag on patients with hepatitis, and report their results

to the Epidemiological Research Laboratory. Histories were available in the case of 335 of the 681 patients reported in one year. Of the 335, only 4 per cent had a history of inoculation for therapy of prophylaxis, and 16 per cent a history of transfusion. In contrast, 34 per cent were drug abusers or had been tattooed. A total of 46 were in medical or related professions. These figures illustrate clearly the fact now becoming evident, that the iatrogenic transfer of the hepatitis B virus is far from being the most important; the infection is clearly circulating in the community by other routes.

Inoculation accidents in hospitals are, nevertheless, certainly concerned in the spread of hepatitis on occasion, and a study is in progress in which hospital staff suffering inoculation accidents are given a dose of anti-hepatitis immunoglobulin in the hope of preventing the development of HB Ag carriage. In the first year 100 persons were so treated and none became a carrier, though two developed a clinical illness.

Studies are also in progress to study the risk of infection to infants born to mothers who are asymptomatic HB Ag carriers. The use of immunoglobulin in such cases is under consideration.

The Poole PHLS laboratory has been studying a newly recognized source of injection hepatitis, namely some batches of the factor VIII concentrate used in the management of patients with haemophilia; most of the cases described have been attributable, on epidemiological grounds, to the hepatitis A virus, which is not yet readily detectable by laboratory tests. Further studies are in progress to determine the magnitude of this problem.

The PHLS has provided evidence to the Committee considering the possible prescription of hepatitis as an industrial disease, and has been extensively consulted in connection with the management queries raised by the hazard of hospital transfer of infection. A major problem, as yet unsolved, is to find a way of measuring the risk of transfer from healthy symptomless carriers. The Manchester laboratory has studied the spread in families but no method has yet been found for a good study in hospitals.

Rubella

The testing of sera from pregnant women for antibody to rubella now constitutes a very substantial part of the work-load in many laboratories, and a total of 308,000 sera were examined in 1974. The proportion of women found sero-negative varied from around 10 per cent in several cities in the North of England to about 19 per cent in less heavily urbanized areas in the South. The national programme for vaccination of school-girls has not been in operation long enough to have any notable effect on the antibody levels in pregnant women, but what has given rise to considerable concern is the fact that in many areas it appears to have proved difficult to ensure that women found sero-negative during pregnancy are vaccinated after delivery. Several have been tested again in a subsequent pregnancy, and found still to lack antibodies. The need for a more aggressive campaign of education and persuasion is evident.

Many of the antibody titrations requested for pregnant women are occasioned by reported exposure or rubella-like illness. In such cases positive evidence of recent infection, as indicated by the presence in serum of rubella, is usually taken

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The heat resistance, growth, biochemical and other characteristics of the organism have been studied and a provisional serotyping scheme comprising 18 antisera has been established. Initial evidence suggests that *B. cereus* food poisoning is associated predominantly with certain serotypes.

There is, unfortunately, no method at present available for detection and measurement of *B. cereus* toxin or toxins in foodstuffs. Tests for enterotoxin production by the implicated organism, following isolation from the rice and faeces, using the ligated rabbit intestine assay are often equivocal. In co-operation with the Microbiological Research Establishment, Porton, experimental work is under way to assess the possible value of monkey feeding tests in the detection of high levels of *B. cereus* toxin.

The clinical and epidemiological value of microbiological laboratory tests

The supply problems of 1974 have given added point to a study that has been initiated under the aegis of the DHSS Laboratory Development Advisory Group in which four PHLS laboratories are collaborating with the Bacteriology Department of the Middlesex Hospital, London, and the Department of Community Medicine in the Middlesex Hospital Medical School. This study will attempt to assess the value of routine laboratory tests. Three overlapping phases are envisaged. The first, which is well under way, is a descriptive study of the microbiological material going through the five participating laboratories. This will be followed by an examination of clinicians' attitudes to microbiological laboratory tests, their expectations of the results and the use made of these results. The third phase will focus on the relative merits of different microbiological investigations in the management of patients with selected clinical conditions.

The PHLS Microbiology Quality Control Laboratory was formed in April 1974 under the direction of Dr. P. B. Crone and is continuing and extending the provision of quality control specimens to PHLS and hospital laboratories throughout the United Kingdom.

SURVEILLANCE OF VACCINATION PROGRAMMES

When any disease becomes relatively uncommon any hazards attached to its prophylaxis attain great importance. A few years ago, routine smallpox vaccination ceased to be advised because, in the face of a successful WHO programme leading towards eradication of the disease, the risk of even the very rare complications of smallpox vaccination could not be disregarded. During the last two years neurological complications attributed to pertussis vaccination have been much discussed with the added problems (not encountered with smallpox) that there has been real doubt just how protective the vaccine may be.

Vaccines issued for prevention of infectious diseases are subject to control by the National Institute for Biological Standards and Control, but supervision of their safety and efficacy in field use requires observations in man. The PHLS maintains a system of surveillance operated by the Epidemiological Research Laboratory to answer specific questions. The method of surveillance varies with the vaccine concerned.

BCG vaccine

The surveillance of BCG vaccine is concerned with estimating the frequency of tuberculin conversion and the size of the vaccination lesions produced by selected batches of vaccine with different viable counts. The National Institute for Biological Standards and Control makes available a sample of the batches intended for routine use, the viable counts of which are known. Using standardized techniques these batches are then used in the Berkshire area to vaccinate school children who are tuberculin negative to a test with 10 IU of PPD. A second tuberculin test is made about six weeks later and the diameter of the reaction as well as the diameter of the vaccine lesion are recorded.

Between October 1973 and the end of December 1974, 21 batches with viable counts ranging from 4·6 to $25{\cdot}5 \times 10^6$/ml were tested. Each produced virtually complete tuberculin conversion with mean reaction diameters from 11·0 to 17·5 mm. The mean diameter of the vaccination lesions ranged from 5·4 to 8·4 mm. There were no complications.

Live poliomyelitis vaccine

Surveillance of poliomyelitis vaccination is concerned chiefly with the possibility that the attenuated vaccine strains of poliomyelitis virus might cause paralysis in the person vaccinated or regain virulence after spread to close contacts.

Each report of a case of poliomyelitis received by the Epidemiological Research Laboratory or notified to the Registrar General is followed up to determine the vaccination history of the patient and contacts. When possible the Virus Reference Laboratory examines any virus isolated to try to determine whether a vaccine or wild strain is involved.

In 1974 there were only five cases of paralytic poliomyelitis in England and Wales and in one of these infection was contracted abroad. None of the patients had recently been vaccinated, but in one instance a contact had received vaccine about a month previously.

Influenza vaccine

In the absence of any general programme for influenza vaccination, surveillance is in the nature of observations on the use of various trial vaccines. Surveillance is based on the HAI antibody response to vaccination. The standard inactivated vaccines containing the A/Port Chalmers strain were checked and found to produce a good response to the homologous strain. An adequate though rather lower response also occurred to the A/Scotland strain. A newly developed, detergent-split, zonally purified vaccine was found to produce a satisfactory HAI antibody response.

Inactivated nasal spray vaccine was used in a large number of university students and naval cadets. There were no adverse reactions, but the antibody is still under study.

During the year live attenuated nasal vaccine containing the Alice strain (A/Eng/42/72) was given to more than 800 students. There were no undue side effects; the antibody studies are not yet complete.

Measles vaccine

The duration of immunity provided by the live vaccine is being studied in about 20,000 children vaccinated in 1964–65, in whom the attack rate from measles is recorded year by year. The findings for 1974 showed that the rates remain extremely low. These encouraging results are supported by a check of measles antibody in about 70 of the children who were vaccinated 10 years previously; only one had no antibody.

Reactions to successive batches of current measles vaccine have been studied in Oxford since 1970. About 300 doses of each of 10 batches of vaccine are given annually, and each child is seen by a nurse during the third week after vaccination. Some reaction was recorded in 25 per cent of children, a figure which has been approximately the same each year. Severe reactions, however, were very uncommon. Convulsions occurred in four of the 2,611 children seen in 1974, but two of them had a history of previous convulsions and one an associated otitis media.

Measles vaccination, by greatly reducing the prevalence of the disease, is bound to interfere with the acquisition of natural immunity. Since not every child is vaccinated, an increasing proportion of children may grow up without having acquired immunity either by vaccination or by natural infection. A study of this aspect of measles vaccination through antibody estimation surveys in school children has been set up in four areas.

Rubella vaccine

Surveillance has been concerned with two main questions. First, how long does vaccine-induced immunity last? Second, how frequent are pronounced reactions to vaccination in adult women after different vaccines?

Since rubella vaccine is given routinely to school-girls between 11 and 14 years old, the presence or absence of rubella antibody in 18-year-old women university entrants who were vaccinated at school will provide some indication of the duration of immunity. Vaccination began to be offered by most local health authorities in the early 1970s and so far few students have been vaccinated prior to entering university. Between 1969 and 1973 the proportion of women students without rubella antibody showed little variation: 22 to 25 per cent. In 1974 this proportion declined to 19 per cent. The observations made in students may provide a base line for the future.

Guidance about the occurrence of severe reactions is also obtained from the students. Women without rubella antibody are offered vaccine and asked to report the occurrence of sore throat, joint pains, arthritis, rash or fever. No serious reactions were encountered in 1974.

Whooping cough vaccine

An assessment of the efficacy of pertussis vaccine is based on a comparison of the whooping cough notification rates in vaccinated and unvaccinated children. About 20 local health authorities with the requisite computer facilities send to the Epidemiological Research Laboratory the numbers of vaccinated and unvaccinated children according to age in their area, and the age and vaccination history of each child notified as having whooping cough. Attack rates are calculated from these data.

In 1973 the rates were substantially less in vaccinated than in unvaccinated children—15 as compared with 45 per 100,000. The reorganization of the Health Service temporarily interrupted this assessment during 1974.

Minor reactions to pertussis vaccine were studied in 900 children in Reading in 1973; findings are reported in the *Lancet* (1974), **2**, 510–3. The occurrence of serious complications due to neurological disease, because of their rarity, requires more extensive surveys. A long-term study based on routine reporting of all reactions was recently begun in co-operation with the North-West Thames Hospital Authority.

FOOD MICROBIOLOGY

From its inception the investigation of food poisoning has been a major activity for the PHLS. Incidents have been studied, information collected and disseminated and preventive measures proposed. Much of our present knowledge about the agents of food-borne bacterial disease has been obtained from painstaking local investigation of incidents carried out by public health laboratories in co-operation with health departments, and from subsequent laboratory research. This research has involved both collaborative work involving several laboratories in surveys and data collection, and individual work of a more fundamental sort at the Food Hygiene Laboratory in Colindale or in area or regional laboratories where the director or a member of his staff has a special interest.

In addition to investigative activities PHLS laboratories have performed routine tests for health authorities on milk, liquid egg, water and shellfish for which official or semi-official standards exist, as part of an on-going programme of microbiological monitoring. Although the PHLS does not undertake routine quality control for industry, its advice is often sought both by individual firms and trade associations and also by national and international bodies. Information obtained from most microbiological laboratories in the British Isles is published weekly in the Communicable Disease Report, which is issued to collaborating laboratories and health authorities. Detailed reports on food poisoning are published annually in the scientific press, as are particular items of scientific work.

All these routine activities continue and many new lines of research are in progress; one example, *Bacillus cereus* food poisoning, has been mentioned already, and published accounts of much work in this field is included in the list of publications (*see* p. 67). But a number of factors have suggested that in the future some change of emphasis may be necessary.

Much of the early interest in food-borne disease centred on food handlers, and the detection and control of carriers of potential pathogens. Although these continue to be of importance, attention is being increasingly directed to contamination of the food itself, either from its origin in infected animals, as when pigs or poultry infected with salmonellas are subjected to large-scale processing, or indirectly when such material contaminates other foodstuffs because of poor factory hygiene. Interest has also been focused on the origin of such infections from the use of contaminated animal feeds or poor husbandry in farms, and, in the factory and the shop, on conditions of storage and refrigeration and the hygiene of implements used in distribution. These problems are

accentuated by the growth of large-scale food processing and wide distribution, often across international boundaries. The growth in container traffic has made import control more difficult as 'inland ports' become more numerous and more active.

Another new factor is a growing interest in microbiological standards for food, particularly on the continent of Europe. Such standards are designed partly to protect consumers against health hazards and partly to ensure good 'quality'. The objective is worthy but the problems of attainment are not always appreciated. Microbiological assessment either by counts or presence of presumed pathogens is difficult to achieve reproducibly and the results are even more difficult to interpret. Furthermore, a very considerable amount of laboratory work is involved, and if this is to be economically expended, careful and skilled sampling techniques, statistically based, must be used. A recent publication* from a group of international experts suggests how a rational sampling programme might be operated and this will no doubt influence future policy, as will the group's previous book† on recommended laboratory techniques.

Thus there is likely to be a demand for more laboratory work on food, at a time when the PHLS is having to meet ever-growing demands for clinical microbiology in its laboratories, most of which are jointly operated with hospital authorities. It is therefore important that resources are used as economically and effectively as possible, and a number of ways of doing so are being considered.

First, discussions are in progress with representatives of local health authorities and port health authorities to achieve an agreed programme of sampling and examination on the basis of existing knowledge. Additionally, where there is inadequate knowledge about the microbial hazards associated with particular foods, attempts are being made to collect such information by selective sampling and examination. Contact is also being maintained with government departments and international bodies. At the same time traditional routine investigations such as environmental swabbing of food premises are being re-evaluated for usefulness.

Second, consideration is being given to the strengthening of the facilities for food examination at certain PHLS laboratories to allow economies of scale and some degree of automation or mechanization for bulk routine investigations. Detailed investigation of acute local incidents and small-scale routine work will continue in all area and regional laboratories.

Third, ways are being sought to collect and distribute the mass of data about food microbiology, now scattered throughout the country. At present only positive findings are commonly reported; negative or acceptable results, not leading to administrative action, but none the less most valuable in establishing baselines and avoiding unprofitable work, are seldom made available.

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* The International Commission on Microbiological Specifications for Foods (ICMSF), 1974, *Micro-organisms in Foods, 2: Sampling for microbiological analysis:* Principles and specific applications. University of Toronto Press.

† ICMSF, 1968, *Micro-organisms in Foods. Their significance and methods of enumeration.* University of Toronto Press and Oxford University Press.

NATIONAL COLLECTION OF TYPE CULTURES

The National Collection of Type Cultures provides a limited service for the examination of strains of bacteria that local laboratories have been unable to identify. A total of 112 strains were submitted in 1974, bringing the total since the service started in 1965 to 938; 721 of these could be identified to one or other of 133 species, or probable species, and 137 to genus, only 80 (8·5 per cent) remaining unidentified.

The Computer Trials Laboratory, operating within the NCTC, can accept for identification Gram-negative rod-shaped bacteria, thought to be of medical interest and for which there is no specific reference laboratory. The computer programmes developed in the laboratory are used to allocate the strains to the most likely taxonomic group. A total of 647 strains were examined in 1973; these fell into 56 species of 24 different genera. Since 1965 a total of 4,027 strains have been received from 290 laboratories. It is hoped to extend the service when resources permit, both to accept more strains and to cover a greater range of taxonomic groups.

ANTIBIOTIC RESISTANCE IN TYPHOID BACILLI AND OTHER SALMONELLAS

The Enteric Reference Laboratory has for many years been studying the agents controlling transferable drug resistance in salmonellas and other enterobacteria, and has contributed substantially to the understanding of the molecular and genetic structure, function and ecological significance of these bacterial plasmids. It is now known that there are two classes of system by which such resistance can be transferred between bacterial strains. In Class 1 the resistance determinant (R factor) and the ' transfer factor ' are covalently bonded together, while in Class 2 two separate plasmids are concerned. The R factors and the various plasmids can themselves be classified in many ways and the full epidemiological study of the origin of the resistance genes in a particular strain of salmonella (or other enterobacterium) can be greatly assisted by detailed identification of the plasmids. Methods for such characterization have been developed in the Enteric Reference Laboratory. These methods have been applied successfully to the study of recent epidemics of chloramphenicol-resistant typhoid fever in Mexico and South-East Asia, and to salmonellosis in many parts of the world.

The epidemic of typhoid fever in Mexico in 1972 involved more than 12,000 cases; all the cultures of *Salmonella typhi* investigated from this epidemic were resistant to chloramphenicol, streptomycin, tetracyclines and sulphonamides, belonged to a single phage type and carried the same R factor, which belonged to a newly-defined group. All the evidence suggests that a single transfer event was the origin of the resistance pattern, and thus that the Mexican outbreak was caused by a single strain of *S. typhi.* In Vietnam and Thailand, the same type of R factor has been identified in resistant strains of the typhoid bacillus, but several different phage types were concerned. Nevertheless, very few resistance transfer events are evidently concerned in the generation of a widespread prevalence of chloramphenicol-resistant strains of *S. typhi.*

Typhoid fever is not at present a serious problem in Britain, and indeed virtually all cases now seen are in individuals infected abroad; only about 20 cases per year are truly indigenous. Moreover, chloramphenicol-resistant strains

have been isolated in Britain on only very few occasions and then only in patients infected abroad. Nevertheless, the earlier widespread use of antibiotics in animal husbandry gave rise to concern that antibiotic-resistant strains selected in this way in food animals might serve as a reservoir from which resistance factors might be transferred to human pathogenic bacteria. The Enteric Reference Laboratory, with the support of a special grant from the Department of Health and Social Security, is carrying out studies to assess this risk. They have measured the frequency with which antibiotic-resistant salmonellas from the faeces of man or food animals had identical resistance transfer systems to strains of *Escherichia coli* isolated from the faeces of the same patient or animal. In man such association was found in, at most, 27 per cent; in animals the corresponding figure was 42 per cent, providing strong evidence that resistance in enterobacterial pathogens can be acquired from the non-pathogenic intestinal bacteria.

The Enteric Reference Laboratory has also been studying the prevalence of antibiotic-resistant *Escherichia coli* in imported and British meat. Some examples of the results are given in Table 3, which shows the proportion of meat samples contaminated with *E. coli*, and that having resistant *E. coli*. The very high proportion of resistant *E. coli* isolated from Dutch veal may be a reflection of the continued use of feed-additive antibiotics in Holland, a use now prohibited in Britain. However, it is interesting that the predominant pattern of multiple drug resistance is identical in both countries.

Drug-resistant *E. coli* were infrequent in Irish beef (slaughtered at about four years) and high in Irish pork (slaughtered at six to eight months), reflecting the fact that antibiotics are predominantly used in younger animals. In Ireland antibiotics are still permitted as feed additives, so that a high proportion of drug resistance is maintained.

The demonstration of a substantial prevalence of drug resistance in American sheep livers, and of a much higher prevalence in lamb livers, suggested that antibiotics were being used in sheep rearing in the United States, a conclusion that was later found to be justified.

The Enteric Reference Laboratory is a World Health Organization Collaborating Laboratory for Phage-typing and Resistance of Enterobacteria and receives strains of salmonellas for examination from many parts of the world. These extensive studies have shown that salmonellas with transferable drug resistance are prevalent in many countries, but that there are often striking geographical differences in the prevalence of particular R factors as well as particular phage types of salmonellas. For example, *Salmonella typhimurium*, phage type 193, with multiple transferable resistance, predominated in paediatric units in Argentina, Paraguay, Uruguay and Brazil, but the strains differed in their R factors from multiple-resistant strains of type 193 isolated in Mexico, and all these differed from the type 193 strains seen in Europe or South-East Asia.

These studies have emphasized once more the importance of widespread and indiscriminate use of antibiotics in man in favouring the spread of drug-resistant bacteria; similar misuse of antibiotics in animal husbandry adds substantially to the pool of resistant organisms from which human pathogens can draw resistance-determining plasmids.

Table 3

Drug resistance in Escherichia coli *isolated from meat*

	Britain					Imported from:				
						Holland	Republic of Ireland		USA	
Animal species	Bovine		Porcine	Ovine		Bovine	Bovine	Porcine	Ovine	
				Sheep	Lambs					
Age	3–6 yr	12–14 wk	6–10 mth	2–3 yr	4–6 mth	12–14 wk	4 yr	6–8 mth	Sheep* livers	Sheep* livers
Number of meat samples	64	35	93	22	46	28	185	131	10	40
Percentage with *E. coli*	*97*	*100*	*96*	*95*	*100*	*100*	*58*	*76*	*70*	*80*
Percentage with drug-resistant *E. coli*	*50*	*74*	*60*	*50*	*50*	*93*	*15*	*72*	*20*	*73*
E. coli isolates, total	620	350	890	210	460	280	641	695	73	321
E. coli isolates, per cent resistant	*32*	*66*	*57*	*19*	*15*	*90*	*12*	*76*	*34*	*87*

*Age unknown.

The streptococcal diseases of man are difficult to prevent by specific public-health measures but generally respond well to appropriate antibiotic treatment. The idea that streptococci have ' lost their virulence ' in recent years has little or no substance; the progressive decrease in the frequency and severity of streptococcal infections in the industrialized countries of the temperate zone, which began before 1900, can be attributed to social changes that have reduced the frequency of exposure of the population to streptococci. Since 1940 this process has been accelerated by the widespread use of antibiotics (notably penicillin) for the treatment of septic and respiratory-tract infections, whether or not a diagnosis of streptococcal infection had been made.

Infections due to group-A streptococci

Until about 20 years ago, interest in epidemic streptococcal infection was concentrated on diseases of the respiratory tract, especially in communities of young people, notably schools and military camps, and the typing system for the group-A streptococci (the commonest cause) was built up for studies of these diseases. The observation—made in the PHLS Streptococcus Reference Laboratory in 1955—that the group-A streptococci isolated from skin lesions, notably impetigo, were in the main untypable in the M-typing system was difficult to explain at that time. Subsequent work with strains from impetigo lesions in children in tropical and sub-tropical countries, mainly in the Streptococcus Laboratory, has clearly established that a series of streptococcal M-types, quite distinct from those responsible for outbreaks of respiratory-tract infections in the temperate zone, cause 'primary' streptococcal disease of the skin. These ' skin ' streptococci are often poorly antigenic in rabbits and typing sera have proved difficult to prepare; fortunately, many of them form ' opacity factors ' (probably lipoproteinases) that have antigenic specificity exactly parallel to that of the M-antigens, and these can be used for typing.

Much of the epidemiological work of recent years has been on streptococcal diseases in the tropics, and was stimulated by the frequency of epidemics of post-streptococcal glomerulonephritis due to certain of the ' skin ' M-types. However, rheumatic fever in the tropics is probably of greater importance than glomerulonephritis, though this fact is often concealed by its non-epidemic distribution. Whether rheumatic fever in the tropics is also associated with streptococcal skin infections is uncertain. Some of the admittedly scanty evidence suggests that it may not be, but clinically detectable streptococcal infection of the upper respiratory tract does not appear to be easy to identify in many tropical countries in which rheumatic heart disease is common; new studies of this problem have been initiated in Trinidad.

The contrasting epidemiological picture of rheumatic fever and glomerulonephritis in the tropics, and the extreme rarity of glomerulonephritis as a sequel to skin sepsis in temperate climates, have provided a stimulus for laboratory work on the nature of the M-antigens of ' skin ' and ' throat ' strains of group-A streptococci and of other ' M-associated ' protein antigens, and on differences in the antibody response to streptococci in rheumatic fever and glomerulonephritis. Little antibody to streptolysin O is formed after skin infections, though antibody to other extracellular products is formed, often in greater amounts than after respiratory-tract infection. In rheumatic fever, complement-

fixing antibody to an ' M-associated ' protein is almost invariably present in high titre, but this is also true of many patients who suffer from uncomplicated throat infections with strains that have caused rheumatic fever in other persons in the same institution. In Britain, it appears that rheumatic fever is associated with certain of the well-recognized ' throat ' M-types, and that the pattern of antibody response found in rheumatic fever is determined by the characters of these supposedly ' rheumatogenic ' types rather than being related to the complication itself. It is hoped to conduct similar studies of the antibody response to cases of rheumatic fever in tropical countries, in which the common ' throat ' streptococci of the temperate zone have rarely been identified.

Streptococcal impetigo is nowadays less common in British school-children than formerly. Epidemics continue to occur in other institutional groups, such as mental hospital patients, and there is a great deal of minor wound sepsis in the general population due to group-A streptococci. Some of this is clearly occupational, and is associated with frequent minor trauma and close physical contact. Outbreaks of septic infection with streptococci resembling those responsible for impetigo have recently been noted among workers in abattoirs and meat-processing factories.

Infections due to group-B streptococci

Interest in infections caused by group-B streptococci has increased greatly in the last 10 years with acute septicaemia or meningeal infection of the newborn infants as the most common severe disease. Group-B streptococci are present in the vagina of some 10 per cent of normal women and it has been assumed that neonatal infection is always from the birth canal, but recent observations in the USA and Czechoslovakia cast some doubt on this assumption.

Systemic disease due to group-B streptococci in older people, most of which is septicaemic rather than meningeal, includes post-partum and post-abortal fevers; but when these are excluded the remainder of the cases are evenly distributed between the sexes. Some but by no means all occur in patients with other serious underlying diseases. Information about the carriage of group-B streptococci at sites other than the vagina, and in males, is fragmentary. A number of preliminary studies of the distribution of group-B streptococci are in progress.

Systemic diseases due to other streptococci

Recent improvements in the classification of streptococci, and a renewed interest in streptococci as a possible cause of dental caries, are beginning to have an effect on clinical microbiology. Two newly defined species have been recognized as common causes of bacterial endocarditis—*Streptococcus mutans* and an organism closely related to *Streptococcus bovis*—and one ' new ' streptococcus as a cause of large and usually single abscesses in the viscera and the central nervous system—*Streptococcus milleri*. Each of these organisms can be identified in the earlier literature; the ' new ' feature in the situation is that it is now feasible by means of relatively simple tests to classify most of the ' green ' or non-haemolytic streptococci from systemic infections in man, so that the spectra of diseases associated with particular sorts of streptococci can be investigated.

The Streptococcus Reference Laboratory has been using these methods in a study of streptococci from patients with bacterial endocarditis. *Streptococcus mutans*, believed to be an important cause of dental caries, is at present responsible for some 10 per cent of cases; it causes endocarditis in substantially the same class of patients as the commoner *Streptococcus sanguis*, notably younger adults with a history of rheumatic or congenital heart disease. Endocarditis due to the *bovis*-like organisms appears, on the other hand, to be confined to middle-aged or elderly patients, among whom males predominate. The causative organism is not part of the flora of the mouth and throat, and although it has been found sporadically in the gut, comprehensive studies of its distribution have not yet been made.

Streptococcus milleri has recently been defined as an aggregate of slowly growing non-haemolytic streptococci, most of which are ungroupable but a minority of which have the Lancefield-group antigen A, C, F or G and ' minute ' beta-haemolytic streptococci of groups F and G. Over half of the isolates from systemic disease are from patients with abscesses in internal organs, which include the brain, the liver and the pleura, or from localized meningitis. *Streptococcus milleri* appears to be a common inhabitant of the dental root-canal and the appendix, but studies of other possible carrier sites have not been made.

LABORATORIES

The Microbiology Quality Control Laboratory (Director: Dr. P. B. Crone) was established in temporary accommodation at Neasden Hospital, London, NW10 8EY, in April 1974.

DEATH

It was with great regret that the Service learned of the death on 16 August 1974 of Professor Robert Cruickshank, the first Director of the Central Public Health Laboratory, Colindale, a post he held from 1945 to 1948.

RETIREMENTS

Dr. Lynette M. Dowsett retired from the Directorship of the Area Public Health Laboratory, Norwich, and Dr. M. H. Hughes from the Directorship of the Area Public Health Laboratory, Winchester. (Dr. Hughes was re-employed on a part-time basis at Winchester until May 1975.) Dr. T. D. F. Money also retired from the Norwich Laboratory during the year.

NEW APPOINTMENTS

The following new Consultant appointments were made during the year: Dr. B. Chattopadhyay, Director of the Area Public Health Laboratory, Whipps Cross Hospital, London, in succession to Dr. B. T. Thom; Dr. Purvin Ispahani and Dr. A. D. Macrae, to the Area Public Health Laboratory, Nottingham; Dr. Nafra A. Johnston, to the Venereal Diseases Reference Laboratory.

Dr. W. Shepherd, Deputy Director of the Area Public Health Laboratory, Norwich, was appointed Director in succession to Dr. Dowsett.

PUBLICATIONS BY MEMBERS OF THE STAFF OF THE PUBLIC HEALTH LABORATORY SERVICE DURING 1974

Besides the specific items mentioned below, there are many publications to which the work of the Service has contributed. The internationally recognised reference laboratories and the Epidemiological Research Laboratory submit figures regularly to W.H.O. for inclusion in their statistical periodicals. Again, the giving of specialist help and advice and the supply of serological reagents are among the functions of the Service, and in the course of the year a number of papers have acknowledged such contributory work by members of the staff. Other unlisted material includes leading articles, unsigned annotations, conference papers which remain unpublished, book reviews, contributions to the various abstracting journals, and notes compiled from the Service's weekly Communicable Disease Report which appear regularly in the Brit. med. J. *and elsewhere.*

ANDERSON, E. S. Chloramphenicol-resistant *Salmonella typhi* in Viet-Nam (Rep. of) and Thailand. *Wkly epid. Rec.*, 1974, **49**, 295.

ANDERSON, E. S. Ecology of transferable drug resistance in the enterobacteria in man and animals. (Abstract) *Vet. Rec.*, 1974, **95**, 127.

ANDERSON, E. S. Group H resistance factors in southern Asia. *Wkly epid. Rec.*, 1974, **49**, 245.

ANDERSON, E. S. How not to use data. *New Scient.*, 1974, **64**, 314.

ANDERSON, E. S. The indiscriminate use of antibiotics . . . *Nature, Lond.*, 1974, **250**, 279.

ANDERSON, E. S. Nalidixic acid, or if you can't beat 'em. . . . *New Scient.*, 1974, **61**, 750.

ANDERSON, E. S. Recombination between unrelated bacterial plasmids. *Ann. Microbiol., Paris*, 1974, **125A**, 251.

ANDERSON, E. S. Transferable drug resistance in salmonella in South and Central America. *Wkly epid. Rec.*, 1974, **49**, 65.

ANDERSON, E. S. and THRELFALL, E. J. The characterization of plasmids in the enterobacteria. *J. Hyg., Camb.*, 1974, **72**, 471.

ANDERSON, E. S., THRELFALL, E. J., CARR, J. M. and FROST, J. A. Transferable drug resistance in salmonellae in South and Central America. (Abstract) *Proc. Soc. gen. Microbiol.*, 1974, **1**, 66.

ANDREWS, B. E. and THOMAS, M. E. M. Colonies of *Trichomonas vaginalis* on mycoplasma medium. (Letter) *Lancet*, 1974, ii, 300.

ANDREWS, R. H., JENKINS, P. A., MARKS, J., PINES, A., SELKON, J. B. and SOMNER, A. R. Treatment of isoniazid-resistant pulmonary tuberculosis with ethambutol, rifampicin and capreomycin: a co-operative study in England and Wales. *Tubercle, Lond.*, 1974, **55**, 105.

ASHESHOV, Elizabeth H. An assessment of the methods used for typing strains of *Pseudomonas aeruginosa*. *Proc. VI nat. Congr. Bact., Athens, 1974*, 1974, p. 9.

BACKHOUSE, C. I. and CARTWRIGHT, R. Y. An outbreak of streptococcal skin sepsis in a closed community. *Brit. med. J.*, 1974, iii, 497.

BAILEY, R. R., ROBERTS, A. P., ROWE, B., GROSS, R. J. and DUMONDE, D. C. The leucocyte migration test in urinary tract infection. *N.Z. med. J.*, 1974, **80**, 10.

BARKER, J. The *in vitro* sensitivity of *Haemophilus influenzae* to clindamycin. *Med. Lab. Tech.*, 1974, **31**, 167.

BARROW, G. I. Microbiological and other hazards from seafoods, with special reference to *Vibrio parahaemolyticus*. *Postgrad. med. J.*, 1974, **50**, 612.

BARROW, G. I. Vibrios, with special reference to *Vibrio parahaemolyticus*. *Synops. sci. Pap. trien. Conf. Inst. med. Lab. Tech., Sheffield, 1974*, 1974, p. 1.

BARROW, G. I. and MILLER, D. C. Growth studies on *Vibrio parahaemolyticus* in relation to pathogenicity. In: *International symposium on Vibrio parahaemolyticus, Tokyo, 1973*, edited by T. Fujino, G. Sakaguchi, R. Sakazaki and Y. Takeda. Tokyo, Saikon Publishing Co., 1974, p. 205.

BARROW, G. I. and MILLER, D. C. The significance of *Vibrio parahaemolyticus* in seafoods. In: *Proceedings of the international symposium on food microbiology, Milan, 1974*. Milan, Federation of Scientific and Technical Associations, 1974, **2**, 31.

BARTELUK, R., LAVENDER, G. W., WILKINSON, A. E. and RODIN, P. Immunofluorescence staining for the detection of *Neisseria gonorrhoeae* in women. *Brit. J. vener. Dis.*, 1974, **50**, 195.

BHATTACHARYYA, M. N. and JEPHCOTT, A. E. Diagnosis of gonorrhoea in women: role of the rectal sample. *Brit. J. vener. Dis.*, 1974, **50**, 109.

BØVRE, K., FUGLESANG, J. E., HENRIKSEN, S. D., LAPAGE, S. P., LAUTROP, H. and SNELL, J. J. S. Studies on a collection of Gram-negative bacterial strains showing resemblance to moraxellae: examination by conventional bacteriological methods. *Int. J. syst. Bact.*, 1974, **24**, 438.

BOYES, B. E., WOOLF, I. L., WHITTAKER, J. S., TAPP, E., JONES, D. M., RENTON, P. H., STRATTON, F., MCSWEEN, R. and DYMOCK, I. W. Liver disease in healthy blood donors associated with presence of hepatitis B antibody. (Abstract) *Gut*, 1974, **15**, 341.

BRADLEY, D. E. and PITT, T. L. Pilus-dependence of four *Pseudomonas aeruginosa* bacteriophages with non-contractile tails. *J. gen. Virol.*, 1974, **23**, 1.

BROWN, D. F. J. and SELKON, J. B. Antibiotic discs active against resistant organisms. (Letter) *Brit. med. J.*, 1974, i, 573.

BUTTERWORTH, A., ABBOTT, J. D., SIMMONS, L. E., IRONSIDE, A. G., MANDAL, B. K., WILLIAMS, R. F., BRENNAND, J., MANN, N. M. and SIMON, S. Diphtheria in the Manchester area, 1967–1971. *Lancet*, 1974, ii, 1558.

CARPENTER, K. Patricia. Shigella. In: *Bergey's Manual of determinative bacteriology*, 8th ed., edited by R. E. Buchanan and N. E. Gibbons. Baltimore, Williams & Wilkins, 1974, p. 318.

CARTWRIGHT, R. Y. Clotrimazole in the treatment of acute and 'resistant' vaginal candidiasis. *Postgrad. med. J.*, 1974, **50**, Suppl. 1, 90.

CARTWRIGHT, R. Y. Commensal bacteria of the human gastro-intestinal tract. *Nurs. Times*, 1974, **70**, 705.

CARTWRIGHT, R. Y. Commensal bacteria of the human respiratory tract. *Nurs. Times*, 1974, **70**, 418.

CAUL, E. O., JACOBS, J. W. and CLARKE, S. K. R. Bovine-testis cells for routine isolation of respiratory syncytial virus from infants. *J. med. Microbiol.*, 1974, **7**, 301.

CAUL, E. O. and ROBERTS, P. C. An evaluation of low voltage counterimmunoelectrophoresis for the detection of hepatitis-B antigen (HB Ag). *J. clin. Path.*, 1974, **27**, 990.

CAUL, E. O., SMYTH, G. W. and CLARKE, S. K. R. A simplified method for the detection of rubella-specific IgM employing sucrose density fractionation and 2-mercaptoethanol. *J. Hyg., Camb.*, 1974, **73**, 329.

CAVANAGH, P. Cholera. (Letter) *Lancet*, 1974, i, 992.

CHAKRAVERTY, Pratima. The detection and multiplication of influenza C virus in tissue culture. *J. gen. Virol.*, 1974, **25**, 421.

CHAKRAVERTY, Pratima, PEREIRA, M. S. and SCHILD, G. C. Use of the single radial diffusion technique for influenza antibody surveys. *Bull. World Hlth Org.*, 1973, **49**, 327.

CHALLACOMBE, D. N., RICHARDSON, J. M., ROWE, B. and ANDERSON, C. M. Bacterial microflora of the upper gastrointestinal tract in infants with protracted diarrhoea. *Arch. Dis. Childh.*, 1974, **49**, 270.

CLYMO, A. B. and HARPER, I. A. Ampicillin-resistant *Haemophilus influenzae* meningitis. (Letter) *Lancet*, 1974, i, 453.

COETZEE, E. F. C. and JOHNSON, R. S. A. An improved blood culture medium. *Med. Lab. Tech.*, 1974, **31**, 299.

COLEMAN, T. J. The induction of diabetes in mice by viruses. *University of Sussex, D.Phil. Thesis*, 1974.

COLEMAN, T. J., TAYLOR, K. W. and GAMBLE, D. R. The development of diabetes following Coxsackie B virus infection in mice. *Diabetologia*, 1974, **10**, 755.

COLLINS, C. H. Management and laboratory safety: conflict or co-operation? *Synops. sci. Pap. trien. Conf. Inst. med. Lab. Tech., Sheffield, 1974*, 1974, p. 25.

COLLINS, C. H. Prevention of laboratory acquired infection. In: *The prevention of laboratory acquired infection.* London, H.M.S.O., *1974*, p. 1. (Publ. Hlth Lab. Serv. Monogr. Ser. No. 6)

COSSART, Yvonne E. Acquisition of hepatitis B antigen in the newborn period. *Postgrad. med. J.*, 1974, **50**, 334.

COWAN, S. T. *Enterobacteriaceae.* In: *Bergey's Manual of determinative bacteriology*, 8th ed., edited by R. E. Buchanan and N. E. Gibbons. Baltimore, Williams & Wilkins, 1974, p. 290.

CRADOCK-WATSON, J. E., MACDONALD, H., RIDEHALGH, M. K. S., BOURNE, M. S. and VANDERVELDE, E. M. Specific immunoglobulin responses in serum and nasal secretions after the administration of attenuated rubella vaccine. *J. Hyg., Camb.*, 1974, **73**, 127.

CRADOCK-WATSON, J. E., RIDEHALGH, M. K. S. and CHANTLER, S. Immunoglobulin responses following rubella infection. (Abstract) *Trans. N.Y. Acad. Sci.*, 1974, **36**, 701.

CRONE, P. B. and TEE, G. H. Staphylococci in swimming pool water. *J. Hyg., Camb.*, 1974, **73**, 213.

DAVIES, J. M., GIBSON, G. L., LITTLEWOOD, J. M. and MEADOW, S. R. Prevalence of bacteriuria in infants and preschool children. *Lancet*, 1974, ii, 7.

DAVIES, Joan R. Elek's test for the toxigenicity of corynebacteria. In: *Laboratory methods 1.* London, H.M.S.O., 1974, p. 1. (Publ. Hlth Lab. Serv. Monogr. Ser. No. 5)

DAVIS, Patricia M. and PHILLPOTTS, R. J. Susceptibility of the VERO line of African green monkey kidney cells to human enteroviruses. *J. Hyg., Camb.*, 1974, **72**, 23.

DE SILVA, L. M., MORTIMER, P. R. and CASEMORE, D. P. Cross-immunity to influenza B virus strains. (Letter) *Brit. med. J.*, 1974, iv, 767.

DE SILVA, L. M., MUHAMMAD, B. M. and DEVADAS, K. Meningococcal disease. (Letter) *Brit. med. J.*, 1974, ii, 665.

DRASAR, B. S. The isolation and identification of non-sporing anaerobes. In: *Infection with non-sporing anaerobic bacteria*, edited by I. Phillips and M. Sussman. Edinburgh, Churchill Livingstone, 1974, p. 20, also contributions to discussion.

EDGAR, W. M. and HAMBLING, M. H. Puerperal rubella vaccination and anti-D immunoglobulin. (Letter) *Brit. med. J.*, 1974, iii, 255.

EDWARD, D. G. ff. Taxonomy of the class Mollicutes. In: *Mycoplasmas of man, animals, plants and insects: proceedings of an INSERM international congress, Bordeaux, 1974*, edited by J. M. Bové and J. F. Duplan. Paris, INSERM, 1974, p. 13.

EDWARDS, Joan M. B. and MCSWIGGAN, D. A. Studies on the diagnostic value of an immunofluorescence test for EB virus-specific IgM. *J. clin. Path.*, 1974, **27**, 647.

EVERALL, P. H., MORRIS, C. A. and MORRIS, D. F. Antibodies to *Candida albicans* in hospital patients with and without spinal injury, and in normal men and women. *J. clin. Path.*, 1974, **27**, 722.

EVERALL, P. H. and WYCHERLEY, P. A. A venepuncturing chair suitable for an outpatient department or laboratory blood collecting room. *J. clin. Path.*, 1974, **27**, 83.

FARRELL, I. D. The development of a new selective medium for the isolation of *Brucella abortus* from contaminated sources. *Res. vet. Sci.*, 1974, **16**, 280.

FENNELL, H., JAMES, D. B. and MORRIS, J. Pollution of a storage reservoir by roosting gulls. *Wat. Treatm. Exam.*, 1974, **23**, 5.

FIELD, Anne M., GARDNER, S. D., GOODBODY, R. A. and WOODHOUSE, M. A. Identity of a newly isolated human polyomavirus from a patient with progressive multifocal leuco-encephalopathy. *J. clin. Path.*, 1974, **27**, 341.

FINNIE, Evelyn M. *Klebsiella aerogenes* infections in the tropics. (Abstract) *J. clin. Path.*, 1974, **27**, 512.

FLECK, D. G. The epidemiology of infection with toxoplasma. *Abstr. Toxoplasmosis Symp., Bratislava, 1974*, 1974, p. 17.

FLECK, D. G. Epidemiology of toxoplasmosis. *Proc. III int. Congr. Parasit., Munich, 1974*, 1974, **1**, 305.

FLECK, D. G. Toxoplasmosis and embryopathy. (Letter) *Brit. med. J.*, 1974, i, 244.

FOORD, N. Studies by tracer methods of air movement and the transport of airborne particles in relation to cross-infection in hospitals. *University of London, Ph.D. Thesis*, 1973.

FURNISS, A. L. and DONOVAN, T. J. The isolation and identification of *Vibrio cholerae*. *J. clin. Path.*, 1974, **27**, 764.

GAMBLE, D. R. Epidemiological and virological observations on juvenile diabetes. *Postgrad. med. J.*, 1974, **50**, Suppl. 3, 538.

GAMBLE, D. R. Viral and epidemiological studies [in diabetes]. (Abstract) *J. clin. Path.*, 1974, **27**, 929.

GAMBLE, D. R., COLEMAN, T. J. and TAYLOR, K. W. Epidemiological and experimental studies in relation to Coxsackie-viruses as an aetiological factor in diabetes. In: *Diabetes: VIII Congress of the International Diabetes Federation, Brussels, 1973*, edited by W. J. Malaisse and J. Pirart. Amsterdam, Excerpta Medica, 1974, p. 321.

GAMBLE, D. R., NELSON, P. G. and PYKE, D. A. Diabetes and virus infection. (Letter) *Lancet*, 1974, ii, 1509.

GIBSON, G. L. Central sterile supply. In: *British health care planning and technology: the British Hospitals Export Council yearbook, 1974*, edited by A. R. J. Wise. London, Health and social Service Journal/Hospital international, 1974, p. 25.

GIBSON, G. L. The problem of the bedpan. *Hlth soc. Serv. J.*, 1974, Suppl. (Cent. Steril. Club XVI annu. Meet., Leeds, 1974), p. 9.

GILBERT, R. J. Staphylococcal food poisoning and botulism. *Postgrad. med. J.*, 1974, **50**, 603.

GILBERT, R. J., STRINGER, M. F. and PEACE, T. C. The survival and growth of *Bacillus cereus* in boiled and fried rice in relation to outbreaks of food poisoning. *J. Hyg., Camb.*, 1974, **73**, 433.

GILLESPIE, E. H. and SMITH, D. F. Ethylene oxide sterilisation in the C.S.S.D. *ASSA J.*, 1973, **2**, No. 1, 5.

GLENCROSS, E. J. G. The isolation and identification of *Listeria monocytogenes*. In: *Laboratory methods 1*. London, H.M.S.O., 1974, p. 8. (Publ. Hlth Lab. Serv. Monogr. Ser. No. 5)

GODDARD, P. and HILL, M. J. The *in vivo* metabolism of cholesterol by gut bacteria in the rat and guinea-pig. *J. Steroid Biochem.*, 1974, **5**, 569.

GOSTLING, J. V. T. and PAYNE, D. J. H. Whooping-cough vaccination. (Letter) *Lancet*, 1974, ii, 773.

GOURLAY, R. N., LEACH, R. H. and HOWARD, C. J. *Mycoplasma verecundum*, a new species isolated from bovine eyes. *J. gen. Microbiol.*, 1974, **81**, 475.

GRINDLEY, N. D. F. A study of the interactions of homologous and non-homologous *fi*− transfer factors. *University of London, Ph.D. Thesis*, 1974.

GROSS, R. J. and ROWE, B. The serology of *Citrobacter koseri*, *Levinea malonatica* and *Levinea amalonatica*. *J. med. Microbiol.*, 1974, **7**, 155.

HALLETT, R. J., PEAD, L. and MASKELL, R. M. Follow-up of urinary-tract infection in children. (Letter) *Lancet*, 1974, ii, 104.

HAMBLING, M. H. Psittacosis. (Letter) *Lancet*, 1974, i, 66.

HARPER, I. A. Laboratory problems in the diagnosis of trachoma. *Trans. ophthal. Soc. U.K.*, 1973, **93**, 641.

HARVEY, R. W. S. Three studies of salmonellae in South Wales. (Abstract) *J. clin. Path.*, 1974, **27**, 931.

HAWKSWORTH, G. and HILL, M. J. The *in vivo* formation of N-nitrosamines in the rat bladder and their subsequent absorption. *Brit. J. Cancer*, 1974, **29**, 353.

HEIMER, G. V. and TAYLOR, C. E. D. Improved mountant for immunofluorescence preparations. *J. clin. Path.*, 1974, **27**, 254.

HENDERSON, R. J. Summary of recent abstracts. VI. Plague. *Trop. Dis. Bull.*, 1974, **71**, 669.

HERBERT, T. J. and MORTIMER, P. P. Recurrent pneumococcal peritonitis associated with an intra-uterine contraceptive device. *Brit. J. Surg.*, 1974, **61**, 901.

HIGGINS, P. G. Recurrent herpes simplex virus infections. *Brit. J. Derm.*, 1974, **91**, 111.

HIGGINS, P. G. Virus isolations from patients in general practice, 1961–71. *J. Hyg., Camb.*, 1974, **72**, 255.

HIGGINS, P. G. Viruses associated with acute respiratory infections, 1961–71. *J. Hyg. Camb.*, 1974, **72**, 425.

HIGGINS, P. G., SCOTT, R. J., DAVIES, P. M. and GAMBLE, D. R. A comparative study of viruses associated with acute haemorrhagic conjunctivitis. *J. clin. Path.*, 1974, **27**, 292.

HILL, L. R. Deduction of phylogenetic (cladistic) groups from phenetic data: application to Mycoplasma and Acholeplasma spp. (Abstract) *Proc. Soc. gen. Microbiol.*, 1974, **1**, 64.

HILL. L. R. Theoretical aspects of numerical identification. *Int. J. syst. Bact.*, 1974, **24**, 494.

HILL, M. J. Bacteria and the etiology of colonic cancer. *Cancer, Philad.*, 1974, **34**, 815.

HILL, M. J. Colon cancer: a disease of fibre depletion or of dietary excess? *Digestion*, 1974, **11**, 289.

HILL, M. J. Steroid nuclear dehydrogenation and colon cancer. *Amer. J. clin. Nutr.*, 1974, **27**, 1475.

HILL, M. J. and DRASAR, B. S. Bacteria and the etiology of cancer of the large intestine. In: *Anaerobic bacteria: role in disease*, edited by A. Balows, R. M. DeHaan, V. R. Dowell and L. B. Guze. Springfield, Thomas, 1974, p. 119.

HILL, M. J., DRASAR, B. S., GODDARD, P., PEACH, S., WILLIAMS, R. E. O., MEADE, T. W., COX, A., SIMPSON, J. E. P. and MORSON, B. Bacteria, bile acids and the aetiology of large-bowel cancer. (Abstract) *J. med. Microbiol.*, 1974, **7**, Pviii.

HILTON, A. L., RICHMOND, S. J., MILNE, J. D., HINDLEY, F. and CLARKE, S. K. R. Chlamydia A in the female genital tract. *Brit. J. vener. Dis.*, 1974, **50**, 1.

HITCHINS, A. J., GOSTLING, J. V. T. and O'DRISCOLL, W. B. Serum hepatitis in late pregnancy. (Letter) *Lancet*, 1974, ii, 343.

HOBBS, Betty C. *Clostridium welchii* and *Bacillus cereus* infection and intoxication. *Postgrad. med. J.*, 1974, **50**, 597.

HOBBS, Betty C. Microbiological hazards of meat production. *Food Manuf.*, 1974, **49**, No. 10, 29.

HOCKNEY, J., BELLENGER, L. and HARPER, I. A. A simple scheme for the early detection of influenza virus type A. *Med. Lab. Tech.*, 1974, **31**, 3.

HOLLINGDALE, M. R. Antibody responses in patients with farmer's lung disease to antigens from *Micropolyspora faeni*. *J. Hyg., Camb.*, 1974, **72**, 79.

HOLMES, B., KING, A., PHILLIPS, I. and LAPAGE, S. P. Sensitivity of *Citrobacter freundii* and *Citrobacter koseri* to cephalosporins and penicillins. *J. clin. Path.*, 1974, **27**, 729.

HOOPER, W. L., BARROW, G. I. and MCNAB, D. J. N. *Vibrio parahaemolyticus* food-poisoning in Britain. *Lancet*, 1974, i, 1100.

HOWELLS, C. H. D., VESSELINOVA-JENKINS, C., EVANS, A. D. and JAMES, J. Some observations on the effect of influenza vaccination in elderly patients. (Abstract) *J. med. Microbiol.*, 1974, **7**, P xxii.

HUGHES, M. H. Consultants' pensions. (Letter) *Brit. med. J.*, 1974, i, 290.

HUGH-JONES, M. E., HARVEY, R. W. S. and MCCOY, J. H. A *Salmonella california* contamination of a turkey-feed concentrate. *St. vet. J.*, 1974, **29**, 89.

HUMPHREYS, G. O., WILLSHAW, G. A. and ANDERSON, E. S. Molecular nature of R factors in different bacterial hosts. (Abstract) *Proc. Soc. gen. Microbiol.*, 1974, **1**, 67.

INGHAM, H. R. and SELKON, J. B. Uticillin. (Letter) *Brit. med. J.*, 1974, iv, 344.

JACOBS, A. and JOYNSON, D. H. M. Lymphocyte function and iron-deficiency anaemia. (Letter) *Lancet*, 1974, ii, 844.

JEPHCOTT, A. E., MORTON, R. S. and TURNER, E. B. Use of transport-and-culture medium combined with immunofluorescence for the diagnosis of gonorrhoea. *Lancet*, 1974, ii, 1311.

JONES, D. M. and ABBOTT, J. D. Meningococcal disease. (Letter) *Brit. med. J.*, 1974, ii, 665.

JOYNSON, D. H. M. and HOWELLS, C. H. L. Antibiotic resistance in coliforms from animal feeding stuffs. (Abstract) *J. clin. Path.*, 1974, **27**, 931.

KELSEY, J. C. Sterilization of fibrescopes. (Letter) *Brit. med. J.*, 1974, iii, 414.

KELSEY, J. C., MACKINNON, I. H. and MAURER, I. M. Sporicidal activity of hospital disinfectants. *J. clin. Path.*, 1974, **27**, 632.

KELSEY, J. C. and MAURER, I. M. An improved (1974) Kelsey-Sykes test for disinfectants. *Pharm. J.*, 1974, **213**, 528.

KURTZ, J. B. and SYKES, D. W. Herpes-simplex virus (type 1) transmitted to a neonate. (Letter) *Lancet*, 1974, ii, 1580.

LAPAGE, S. P. Freeze-drying in culture collections. (Abstract) *Abstr. I. intersect. Congr. int. Ass. microbiol. Soc., Tokyo, 1974*, 1974, p. 174.

LAPAGE, S. P. Genus Cardiobacterium. In: *Bergey's Manual of determinative bacteriology*, 8th ed., edited by R. E. Buchanan and N. E. Gibbons. Baltimore, Williams & Wilkins, 1974, p. 377.

LAPAGE, S. P. *Haemophilus vaginalis*. In: *Bergey's Manual of determinative bacteriology*, 8th ed., edited by R. E. Buchanan and N. E. Gibbons. Baltimore, Williams & Wilkins, 1974, p. 368.

LAPAGE, S. P. Practical aspects of probabilistic identification of bacteria. *Int. J. syst. Bact.*, 1974, **24**, 500.

LAPAGE, S. P. Probabilistic identification of bacteria. *Abstr. Commun. Symp. rapid Meth. Autom. Microbiol., Stockholm, 1973*, 1973, p. 57.

LAPAGE, S. P. and WILLCOX, W. R. A simple method for analysing binary data. *J. gen. Microbiol.*, 1974, **85**, 376.

LEE, J. A. Recent trends in human salmonellosis in England and Wales: the epidemiology of prevalent serotypes other than *Salmonella typhimurium*. *J. Hyg. Camb.*, 1974, **72**, 185.

LE MINOR, L., ROHDE, R. and ROWE, B. Supplément No XVII au schéma de Kauffmann-White. *Ann. Microbiol., Paris*, 1974, **125A**, 427.

LENDRUM, R., WALKER, J. G., WEST, B. and HILL, M. J. Effects of sulphasalazine (Salazopyrin) on faecal flora in patients with inflammatory bowel disease. (Abstract) *Gut*, 1974, **15**, 344.

LEWES, D., RAINFORD, D. J. and LANE, W. F. Symptomless myocarditis and myalgia in viral and *Mycoplasma pneumoniae* infections. *Brit. Heart J.*, 1974, **36**, 924.

LIDWELL, O. M. Aerial dispersal of micro-organisms from the human respiratory tract. In: *The normal microbial flora of man*, edited by F. A. Skinner and J. G. Carr. London, Academic Press, 1974, p. 135. (Soc. appl. Bact. Symp. Ser. No. 2)

LIDWELL, O. M. The place of ultra-clean air systems in hospitals. In: *International symposium on contamination control, London, 1974: proceedings*, edited by S. Black. London, Sam Black Organisation Ltd., 1974, p. 10.

LIDWELL, O. M. Unidirectional ('laminar') air-flow ventilation in hospitals. In: *R³-Symposium, Hamar*, 1974. Nordiska Föreningen för Renlighetsteknik & Rena Rum, 1974, Paper VI.

LIDWELL, O. M., TOWERS, A. G., BALLARD, J. and GLADSTONE, B. Transfer of micro-organisms between nurses and patients in a clean air environment. *J. appl. Bact.*, 1974, **37**, 649.

MACCALLUM, F. O., CHINN, I. J. and GOSTLING, J. V. T. Antibodies to herpes-simplex virus in the cerebrospinal fluid of patients with herpetic encephalitis. *J. med. Microbiol.*, 1974, **7**, 325.

MCCOY, J. H. Enteric and salmonella infection: the carrier state. In: *The normal microbial flora of man*, edited by F. A. Skinner and J. G. Carr. London, Academic Press, 1974, p. 221. (Soc. appl. Bact. Symp. Ser. No. 3)

MCELBOROUGH, D. J. Immunoelectro-osmophoresis and the rapid diagnosis of Hashimoto's disease. *Med. Lab. Tech.*, 1974, **31**, 221.

MCGHIE, D., HUTCHISON, J. G. P. and GEDDES, A. M. Serum-gentamicin. (Letter) *Lancet*, 1974, ii, 1463.

MACKINNON, I. H. The use of inactivators in the evaluation of disinfectants. *J. Hyg., Camb.*, 1974, **73**, 189.

MACKINTOSH, T. F. and DADSWELL, J. V. Ampicillin-resistant *Haemophilus influenzae* meningitis. (Letter) *Lancet*, 1974, ii, 103.

MCSWIGGAN, D. A. and COLLINS, C. H. The isolation of *M. kansasii* and *M. zenopi* from water systems. *Tubercle, Lond.*, 1974, **55**, 291.

MCSWIGGAN, D. A., HUSSAIN, K. K. and TAYLOR, I. O. A fatal case of cutaneous anthrax. *J. Hyg., Camb.*, 1974, **73**, 151.

MAIR, Hélène J., SANSOME, D. A. W. and TILLETT, H. E. A controlled trial of inactivated monovalent influenza A vaccines in general practice. *J. Hyg. Camb.*, 1974, **73**, 317.

MAIR, N. S., RANDALL, C. J., THOMAS, G. W., HARBOURNE, J. F., MCCREA, C. T. and COWL, K. P. *Actinobacillus suis* infection in pigs: a report of four outbreaks and two sporadic cases. *J. comp. Path.*, 1974, **84**, 113.

MAIR, N. S. and ZIFFO, G. S. Isolation of *Y. pseudotuberculosis* from a foal. *Vet. Rec.*, 1974, **94**, 152.

MANSOURIAN, P. G., RINALDI, J. and TAYLOR, C. E. D. Quantitative detection of microbes by digital techniques. *Automedica*, 1974, **1**, 67.

MARKS, J. The culture and identification of mycobacteria. In: *Laboratory methods I*, London, H.M.S.O., 1974, p. 14. (Publ. Hlth Lab. Serv. Monogr. Ser. No. 5)

MARKS, J. Notes on the Ziehl-Neelsen staining of sputum. *Tubercle, Lond.*, 1974, **55**, 241.

MARPLES, R. R. Effects of soaps, germicides and disinfectants on the skin flora. In: *The normal microbial flora of man*, edited by F. A. Skinner and J. G. Carr. London, Academic Press, 1974, p. 35. (Soc. appl. Bact. Symp. Ser. No. 3)

MASKELL, Rosalind M. Importance of coagulase-negative staphylococci as pathogens in the urinary tract. *Lancet*, 1974, i, 1155.

MASKELL, Rosalind M. Pathogens in the urinary tract. (Letter) *Lancet*, 1974, i, 1297.

MAURER, Isobel M. Cleaning hospitals. *Hlth soc. Serv. J.*, 1974, Suppl. (Hospital cleaning), p. 14.

MAURER, Isobel M. Hygienic hospital housekeeping. (King's Fund Centre meeting report) *Hlth soc. Serv. J.*, 1974, **84**, 299.

MAXTED, W. R., WIDDOWSON, J. P. and FRASER, C. A. M. Antibody to streptococcal serum opacity factor. In: *Streptococcal disease and the community: proceedings of the fifth international symposium on Streptococcus pyogenes, Amsterdam, 1972*, edited by M. J. Haverkorn. Amsterdam, Excerpta Medica, 1974, p. 132.

MAXTED, W. R., WIDDOWSON, J. P., FRASER, C. A. M., BALL, L. and BASSETT, D. C. J. Streptococcal typing by means of the serum opacity reaction. In: *Streptococcal disease and the community: proceedings of the fifth international symposium on Streptococcus pyogenes, Amsterdam, 1972*, edited by M. J. Haverkorn. Amsterdam, Excerpta Medica, 1974, p. 48.

MEERS, P. D. The bacteriological examination of urine: a computer-aided study. *J. Hyg., Camb.*, 1974, **72**, 229.

MEERS, P. D. Oxolinic acid in urinary infections. (Letter) *Lancet*, 1974, ii, 721.

MEERS, P. D. and CHURCHER, G. M. Membrane filtration in the study of antimicrobial drugs. *J. clin. Path.*, 1974, **27**, 288.

MEISSNER, Gertrud, SCHRÖDER, K. H., AMADIO, G. E., ANZ, W., CHAPARAS, S., ENGEL, H. W. B., JENKINS, P. A., KÄPPLER, W., KLEEBERG, H. H., KUBALA, E., KUBIN, M., LAUTERBACH, D., LIND, A., MAGNUSSON, M., MIKOVA, Z., PATTYN, S. R., SCHAEFER, W. B., STANFORD, J. L., TSUKAMURA, M., WAYNE, L. G., WILLERS, I. and WOLINSKY, E. A co-operative numerical analysis of nonscoto- and nonphotochromogenic slowly growing mycobacteria. *J. gen. Microbiol.*, 1974, **83**, 207.

MILLER, Christine L., POLLOCK, T. M. and CLEWER, A. D. E. Whooping-cough vaccination: an assessment. *Lancet*, 1974, ii, 510.

MILLER, Christine L., POLLOCK, T. M. and CLEWER, A. D. E. Whooping-cough vaccination. (Letter) *Lancet*, 1974, ii, 773.

MILLER, D. L. and MOORE, B. Laboratory reports in the measurement of ill health due to communicable disease. In: *Uses of epidemiology in planning health services*, edited by A. M. Davies. Belgrade, International Epidemiological Association, 1973, **I**, 476. (Proc. VI int. sci. Meet., Primosten, Yugosl., 1971)

MITCHELL, D. N., BRADSTREET, C. M. P., DIGHERO, M. W., HINSON, K. F. W. and REES, R. J. W. Irradiated Kveim suspensions. (Letter) *Lancet*, 1974, i, 734.

MITCHELL, E. R. Merits or otherwise of sterilising theatre and other instruments prior to handling by staff of CSSD/TSSU. *ASSA J.*, 1974, **3**, 5.

MITCHELL, N. J. and GAMBLE, D. R. Clothing design for operating-room personnel. *Lancet*, 1974, ii, 1133.

MOORE, B. Scientific services in the water industry: public health aspects. *Wat. Treatm. Exam.*, 1974, **23**, 269.

MOORE, B., CARTWRIGHT, R. Y., BISSON, P. G., TRATT, J., TYRRELL, D. A. J., DARK, F. A., HARPER, G. J., HUTCHISON, J. G. P., ROBERTSON, M. J., FLEWETT, T. H., JONES, D. M., TOBIN, B. M. and HARLOW, G. R. Spread of hepatitis in dialysis units. (Letter) *Lancet*, 1974, ii, 842.

MORRIS, C. A. Urinary tract infections in paraplegics: prevention. (Abstract) *J. clin. Path.*, 1974, **27**, 933.

MORRIS, C. A. and EVERALL, P. H. Antibodies to *Candida albicans* in hospital patients with and without spinal injury, and in normal men and women. (Abstract) *J. med. Microbiol.*, 1974, **7**, Pxxiv.

MORRIS, C. A. and EVERALL, P. H. Bowie and Dick test. (Letter) *Lancet*, 1974, i, 1118.

MORRIS, C. A. and EVERALL, P. H. Bowie and Dick test for autoclaves. (Letter) *Lancet*, 1974, ii, 1382.

MORSE, Anne R., COLEMAN, D. V. and GARDNER, S. D. An evaluation of cytology in the diagnosis of herpes simplex infection and cytomegalovirus infection of the cervix uteri. *J. Obstet. Gynec. Brit. Cwlth*, 1974, **81**, 393.

MORTIMER, P. R. and MCCANN, G. Food-poisoning episodes associated with *Bacillus cereus* in fried rice. *Lancet*, 1974, i, 1043.

MUMMERY, R. V., ROWE, B. and GROSS, R. J. Urinary-tract infections due to atypical *Enterobacter cloacae*. (Letter) *Lancet*, 1974, ii, 1333.

NAGINGTON, J., WATSON, P. G., PLAYFAIR, T. J., MCGILL, J., JONES, B. R. and STEELE, A. D. McG. Amoebic infection of the eye. *Lancet*, 1974, ii, 1537.

NOAH, N. D. Communicable disease control. *Community Hlth*, 1974, **6**, 46.

NOAH, N. D. *Mycoplasma pneumoniae* infection in the United Kingdom—1967–73. *Brit. med. J.*, 1974, ii, 544.

OKUBADEJO, O. A. Iron and resistance to infection. (Letter) *Lancet*, 1974, ii, 467.

OKUBADEJO, O. A. Susceptibility of *Bacteroides fragilis* to co-trimoxazole. (Letter) *Lancet*, 1974, i, 1061.

OKUBADEJO, O. A. and MCFARLANE, H. Bacterial growth in blood from patients with sickle-cell anaemia or kwashiorkor. (Letter) *Amer. J. clin. Path.*, 1974, **61**, 308.

OKUBADEJO, O. A. and MASKELL, R. M. Co-trimoxazole resistance. (Letter) *Brit. med. J.*, 1974, ii, 227.

OWEN, R. J. and LAPAGE, S. P. A comparison of strains of King's group IIb of *Flavobacterium* with *Flavobacterium meningosepticum*. *Antonie van Leeuwenhoek*, 1974, **40**, 255.

PAMPLIGIONE, S. and WILKINSON, A. E. A study of yaws among pygmies in Cameroon and Zaire. WHO/VDT/74.397, 1974. (Wld Hlth Org. working document)

PARKER, M. T. Assignment report: A. National Health Laboratory Service; and B. Hospital infections in the Sudan, 10 February–9 April 1974. WHO/EM/LAB/117, 1974. (Wld Hlth Org. working document)

PARKER, M. T., ASHESHOV, E. H., HEWITT, J. H., NAKHLA, L. S. and BROCK, B. M. Endemic staphylococcal infections in hospitals. *Ann. N.Y. Acad. Sci.*, 1974, **236**, 466.

PAVER, W. K., CAUL, E. O. and CLARKE, S. K. R. Comparison of a 22 nm virus from human faeces with animal parvoviruses. *J. gen. Virol.*, 1974, **22**, 447.

PAYLER, D. K. and SKIRROW, M. B. Intradermal influenza vaccination. (Letter) *Brit. med. J.*, 1974, ii, 727.

PAYNE, D. J. H. Chronic brucellosis. (Letter) *Brit. med. J.*, 1974, ii, 221.

PEAD, P. J. Estimation of rubella-specific IgM antibody in sera by single fraction collection on Sephadex G-200. *Med. Lab. Tech.*, 1974, **31**, 159.

PEARSON, A. D. Epidemiology of tularemia in Norway and Sweden. (Abstract) *J. gen. Microbiol.*, 1974, **81**, xi.

PEARSON, C. H. and WHITEHEAD, J. E. M. Antibiotic sensitivity testing: a modification of the Stokes method using a rotary plater. *J. clin. Path.*, 1974, **27**, 430.

PILSWORTH, R. Protective inoculations in the control of laboratory infections. In: *The prevention of laboratory acquired infections*. London, H.M.S.O., 1974, p. 55. (Publ. Hlth Lab. Serv. Monogr. Ser. No. 6)

PINNEY, Alison M. Some type-associated characteristics of group A streptococci. In: *Streptococcal disease and the community: proceedings of the fifth international symposium on Streptococcus pyogenes, Amsterdam, 1972*, edited by M. J. Haverkorn. Amsterdam, Excerpta Medica, 1974, p. 56.

POLAKOFF, Sheila. Decrease in the incidence of hepatitis in dialysis units associated with prevention programme: Public Health Laboratory Service survey. *Brit. med. J.*, 1974, iv, 751.

PROWSE, K. and CAVANAGH, P. Tuberculosis retreats—slowly. (Letter) *Lancet*, 1974, i, 1222.

REDWAY, K. F. and LAPAGE, S. P. Effect of carbohydrates and related compounds on the long-term preservation of freeze-dried bacteria. *Cryobiology*, 1974, **11**, 73.

RICHMOND, Shirley J. The isolation of chlamydia subgroup A (*Chlamydia trachomatis*) in irradiated McCoy cells. *Med. Lab. Tech.*, 1974, **31**, 7.

ROBERTS, Diane and HOBBS, B. C. Feeding the traveller. *R. Soc. Hlth J.*, 1974, **94**, 114.

ROBERTSON, L., FARRELL, I. D. and HINCHLIFFE, R. M. The incidence of brucella infections in producer-retailer herds in north Lancashire from 1965 to 1972. *J. Hyg., Camb.*, 1974, **73**, 9.

ROWE, B. *Escherichia coli* O148 and diarrhoea in adults. (Letter) *Brit. med. J.*, 1974, iii, 741.

ROWE, B., GROSS, R. J. and ALLEN, H. A. Enteropathogenic *E. coli* O124 in the United Kingdom. (Letter) *Lancet*, 1974, i, 224.

ROWE, B., GROSS, R. J. and ALLEN, H. A. *Shigella dysenteriae* and *Shigella boydii* in England and Wales during 1972 and 1973. *Brit. med. J.*, 1974, iv, 641.

ROWE, B., GROSS, R. J., LINDOP, R. and BAIRD, R. B. A new *E. coli* O group O158 associated with an outbreak of infantile enteritis. *J. clin. Path.*, 1974, **27**, 832.

SCHAEFER, W. B., WOLINSKY, E., JENKINS, P. A. and MARKS, J. *Mycobacterium szulgai*—a new pathogen: serological identification and report of eight new cases. *Proc. VIII jt Tuberc. Conf. U.S.-Jap. coop. med. Sci. Progr., New Orleans*, 1973, p. 384.

SCHILD, G. C., OXFORD, J. S., DOWDLE, W. R., COLEMAN, M., PEREIRA, M. S. and CHAKRAVERTY, P. Antigenic variation in current influenza A viruses: evidence for a high frequency of antigenic 'drift' for Hong Kong virus. *Bull. World Hlth Org.*, 1974, **51**, 1.

SEAL, P. V. and MORRIS, C. A. Brucellosis of the carpus: report of a case. *J. Bone Jt Surg.*, 1974, **56B**, 327.

SHAVE, P. A. and THOM, B. T. Outbreak of giardiasis. (Letter) *Brit. med. J.*, 1974, i, 288.

SHEARING, G. and JOHNSTONE, G. F. The evaluation of a number of blood agar base culture media. *Med. Lab. Tech.*, 1974, **31**, 135.

SHERIDAN, P., MACCAIG, J. N. and HART, R. J. C. Myocarditis complicating Q fever. *Brit. med. J.*, 1974, ii, 155.

SMITH, H. R., HUMPHREYS, G. O. and ANDERSON, E. S. Genetic and molecular characterisation of some non-transferring plasmids. *Molec. gen. Genet.*, 1974, **129**, 229; also abstract in *Proc. Soc. gen. Microbiol.*, 1974, **1**, 66.

SMITH, J. W. G. Human tetanus immunoglobulin. *Bull. Haffkine Inst.*, 1974, **2**, 94.

SMITH, J. W. G. Influenza. *Med. Week*, 1974, No. 33, 8.

SMITH, J. W. G. Vaccination in the control of influenza: interim report to the Director of the Public Health Laboratory Service on a collaborative study with the Post Office. *Lancet*, 1974, ii, 330.

SMITH, J. W. G. and MACIVER, A. G. Growth and toxin production of tetanus bacilli *in vivo*. *J. med. Microbiol.*, 1974, **7**, 497.

SMITH, J. W. G., POLLARD, R., FLETCHER, W. B., BARKER, R. and LEWIS, J. R. Influenza vaccination: acceptance in an industrial population. *Brit. J. indust. Med.*, 1974, **31**, 292.

SOMPOLINSKY, D. and RICHMOND, S. J. Growth of *Chlamydia trachomatis* in McCoy cells treated with cytochalasin B. *Appl. Microbiol.*, 1974, **28**, 912.

STEVENS, D., BURMAN, D., CLARKE, S. K. R., LAMB, R. W., HARPER, M. E. and SARAFIAN, A. H. Temporary paralysis in childhood after influenza B. *Lancet*, 1974, ii, 1354.

TANNER, Elizabeth I. and BULLIN, C. H. Thymidine-dependent *Escherichia coli* infection and some associated laboratory problems. *J. clin. Path.*, 1974, **27**, 565.

TAPP, E., JONES, D. M., ANFIELD, C., WHITTAKER, J. S., WOOLF, I. L. and DYMOCK, I. W. Intranuclear particles in hepatocytes of HBAg-positive blood-donors. (Letter) *Lancet*, 1974, i, 934.

TAPP, E., JONES, D. M. and TOBIN, J. O'H. The interpretation of respiratory tract histology in cot deaths. (Abstract) *J. clin. Path.*, 1974, **27**, 930.

TAYLOR, A. J. Isolation and identification of erwinia in a hospital laboratory. *Med. Lab. Tech.*, 1974, **31**, 37.

TAYLOR, C. E. D. and HEIMER, G. V. Measuring immunofluorescence emission in terms of standard international physical units. *J. biol. Standard*, 1974, **2**, 11.

TAYLOR, C. E. D. and HEIMER, G. V. Quantitative immunofluorescence studies. (Abstract) *Trans. N.Y. Acad. Sci.*, 1974, **36**, 697.

THOMAS, Mair E. M. The 'filth row'. (Letter) *Brit. med. J.*, 1974, ii, 223.

THOMAS, Mair E. M. Isolation and identification of lactobacilli from the genital tract. In: *Laboratory methods 1.* London, H.M.S.O., 1974, p. 30. (Publ. Hlth Lab. Serv. Monogr. Ser. No. 5)

THOMAS, Mair E. M. Misleading discs. (Letter) *Brit. med. J.*, 1974, ii, 272.

THOMAS, Mair E. M. Prevention of convulsions. (Letter) *Lancet*, 1974, ii, 894.

THOMAS, Mair E. M. and DZIEJKO, M. Co-trimoxazole resistance. (Letter) *Brit. med. J.*, 1974, i, 328.

THOMAS, Mair E. M. and HOLLINS, M. Epidemic of postoperative wound infection associated with ungloved abdominal palpation. *Lancet*, 1974, i, 1215.

THOMAS, Mair E. M. and HOLLINS, M. Postoperative gynecological wound infection. (Letter) *Lancet*, 1974, ii, 157.

THOMAS, Mair E. M., NOAH, N. D., TILLETT, H. E., DADSWELL, J. V. and WALKER, P. H. Recurrent gastroenteritis in a preparatory school caused by *Shigella sonnei* and another agent. *Lancet*, 1974, i, 978.

THOMPSON, R. G. and HARPER, I. A. Lawn mower injuries. (Letter) *Brit. med. J.*, 1974, iii, 687.

THOMPSON, R. G., KARANDIKAR, D. S. and LEEK, J. Giardiasis: an unusual cause of epidemic diarrhoea. *Lancet*, 1974, i, 615.

TILLETT, Hilary E. and THOMAS, M. E. M. Culture of faeces in the diagnosis of Sonne dysentery: a statistical method for estimating the true isolation rate. *Int. J. Epidem.*, 1974, **3**, 177.

TOBIN, J. O'H., MACDONALD, H., DOYLE, L. and TAYLOR, J. L. Unsuspected cytomegalic mononucleosis. (Letter) *Brit. med. J.*, 1974, ii, 385.

TOMKINS, A. M., JAMES, W. P. T. and DRASAR, B. S. A malabsorption syndrome in overland travellers to India: mucosal colonization by bacteria. (Abstract) *Gut*. 1974, **15**, 340.

TOMLINSON, A. H., CHINN, I. J. and MACCALLUM, F. O. Immunofluorescence staining for the diagnosis of herpes encephalitis. *J. clin. Path.*, 1974, **27**, 495.

TULLY, J. G., BARILE, M. F., EDWARD, D. G. ff., THEODORE, T. S. and ERNØ, H. Characterization of some caprine mycoplasmas, with proposals for new species, *Mycoplasma capricolum* and *Mycoplasma putrefaciens*. *J. gen. Microbiol.*, 1974, **85**, 102.

TURNER, G. C. Hepatitis. In: *A new look at infectious diseases.* London, British Medical Association, 1974, p. 58. (Reprinted from *Brit. med. J.*, 1973, i. 476.)

TURNER, L. H. Leptospira. In: *Bergey's Manual of determinative bacteriology*, 8th ed., edited by R. E. Buchanan and N. E. Gibbons. Baltimore, Williams & Wilkins, 1974, p. 190.

TURNER, L. H. Leprospirosis. In: *Medicine in the tropics*, edited by A. W. Woodruff. Edinburgh, Churchill Livingstone, 1974, p. 365.

TURNER, L. H. Leptospirosis. In: *A new look at infectious diseases*. London, British Medical Association, 1974, p. 66. (Reprinted from *Brit. med. J.*, 1973, i, 537.)

URQUHART, G. E. D. Serum IgM and IgA responses in influenza A. *J. clin. Path.*, 1974, **27**, 198.

URQUHART, G. E. D. Sudden death in infancy: studies in virology and immunology. In: *SIDS* 1974*: proceedings of the Francis E. Camps international symposium on sudden and unexpected deaths in infancy, Toronto, 1974*, edited by R. R. Robinson. Canadian Foundation for the Study of Infant Deaths, 1974, p. 107.

VANDERVELDE, Elise M., MAHMOOD, N., GOFFIN, C., PORTER, A. A., MEGSON, B. and COSSART, Y. E. User's guide to some new tests for hepatitis-B antigen. *Lancet*, 1974, ii, 1066.

VERHOEF, J. and JONES, D. M. Pneumococcal antigen in sputum. (Letter) *Lancet*, 1974, i, 879.

VERNON, Enid and TILLETT, H. E. Food poisoning and salmonella infections in England and Wales, 1969–1972: an analysis of reports to the Public Health Laboratory Service. *Publ. Hlth, Lond.*, 1974, **88**, 225.

WHITE, G. B. B., ASHTON, C. I., ROBERTS, C. and PARRY, H. E. 'Rotavirus' in gastroenteritis. (Letter) *Lancet*, 1974, ii, 726.

WHITFIELD, M. J., ROOME, A. P. C. H. and CLARKE, S. K. R. Respiratory symptoms and rash in mumps. *Practitioner*, 1974, **212**, 72.

WIDDOWSON, Jean P., MAXTED, W. R., NEWRICK, C. W. and PARKIN, D. An outbreak of rheumatic fever among Air Force cadets. In: *Streptococcal disease and the community: proceedings of the fifth international symposium on Streptococcus pyogenes, Amsterdam, 1972*, edited by M. J. Haverkorn. Amsterdam, Excerpta Medica, 1974, p. 338.

WIDDOWSON, Jean P., MAXTED, W. R., NEWRICK, C. W. and PARKIN, D. An outbreak of streptococcal sore throat and rheumatic fever in a Royal Air Force training camp: significance of serum antibody to M-associated protein. *J. Hyg., Camb.*, 1974, **72**, 1.

WIDDOWSON, Jean P., MAXTED, W. R., NOTLEY, C. M. and PINNEY, A. M. The antibody responses in man to infection with different serotypes of group-A streptococci. *J. med. Microbiol.*, 1974, **7**, 483.

WIDDOWSON, Jean P., MAXTED, W. R., NOTLEY, C. M. and PINNEY, A. M. Type-specific and M-associated antibody response to different serotypes of group A streptococci. In: *Streptococcal disease and the community: proceedings of the fifth international symposium on Streptococcus pyogenes, Amsterdam, 1972*, edited by M. J. Haverkorn. Amsterdam, Excerpta Medica, 1974, p. 116.

WIENEKE, Antonnette A. Enterotoxin production by strains of *Staphylococcus aureus* isolated from foods and human beings. *J. Hyg., Camb.*, 1974, **73**, 255.

WILKINSON, A. E. and JOHNSTON, N. A. A comparison between sorbent and Reiter sonicate in the FTA-ABS test. (Abstract) *Trans. N.Y. Acad. Sci.*, 1974, **36**, 701.

WILLIAMS, J. D. and CAVANAGH, P. Ampicillin-resistant *Haemophilus influenzae* meningitis. (Letter) *Lancet*, 1974, i, 864.

WILLIAMS, J. D., KATTAN, S. and CAVANAGH, P. Penicillinase production by *Haemophilus influenzae*. (Letter) *Lancet*, 1974, ii, 103.

WILLIAMS, R. E. O. Bacteria in the etiology of colon cancer. *Abstr. XI int. Cancer Congr., Florence, 1974*, 1974, **1**, 178.

WILLIAMS, R. E. O. Introduction. In: *Infection with non-sporing anaerobic bacteria*, edited by I. Phillips and M. Sussman. Edinburgh, Churchill Livingstone, 1974, p. 1.

WILLIAMS, W. J., PIOLI, E., JONES, D. J., CALCRAFT, B., JOHNSON, A. J. and DIGHERO, M. W. *In vitro* Kveim-induced macrophage inhibition factor, KMIF test, in sarcoidosis, Crohn's disease and tuberculosis. *Proc. VI int. Conf. Sarcoidosis, Tokyo, 1974*, 1974, p. 44.

WILLIS, A. T. Anaerobic infections. *Brit. J. Hosp. Med.*, 1974, **12**, 218.

WILLIS, A. T. Some infections due to anaerobic sporeforming bacilli. I: *Anaerobic bacteria: role in disease*, edited by A. Balows, R. M. DeHaan, V. R. Dowell and L. B. Guze. Springfield, Thomas, 1974, p. 195.

WILLIS, A. T., YOUNG, S. E. J. and FERGUSON, I. R. Infections due to non-sporing anaerobes: some illustrative cases. In: *Infection with non-sporing anaerobic bacteria* edited by I. Phillips and M. Sussmann. Edinburgh, Churchill Livingstone, 1974, p. 189.

WINDSOR, G. D., NICHOLLS, A., MAINI, R. N., EDWARD, D. G. ff., LEMCKE, R. M. and DUMONDE, D. C. Search for mycoplasma in synovial fluids from patients with rheumatoid arthritis. *Ann. rheum. Dis.*, 1974, **33**, 70.

WOOLF, I. L., BOYES, B. E., JONES, D. M., WHITTAKER, J. S., TAPP, E., MACSWEEN, R. N. M., RENTON, P. H., STRATTON, F. and DYMOCK, I. W. Asymptomatic liver disease in hepatitis B antigen carriers. *J. clin. Path.*, 1974, **27**, 348.

WRIGHT, A. E. Nursing and the laboratory: aspects of immunity. *Nurs. Times*, 1973, **69**, 1224.

Books

DRASAR, B. S. and HILL, M. J. *Human intestinal flora.* London, Academic Press, 1974.

COLLINS, C. H., HARTLEY, E. G. and PILSWORTH, R. *The prevention of laboratory acquired infection.* London, H.M.S.O., 1974. (Publ. Hlth Lab. Serv. Monogr. Ser. No. 6)

DAVIES, Joan R., GLENCROSS, E. J. G., MARKS, J., PLOWS, C. D. and THOMAS, M. E. M. *Laboratory methods 1.* London, H.M.S.O., 1974. (Publ. Hlth Lab. Serv. Monogr. Ser. No. 5)

GIBSON, G. L., ed. *Infection in hospital: a code of practice*, 2nd ed. Edinburgh, Churchill Livingstone, 1974.

HARVEY, R. W. S. and PRICE, T. H. *Isolation of salmonellas.* London, H.M.S.O., 1974. (Publ. Hlth Lab. Serv. Monogr. Ser. No. 8)

HOBBS, Betty C. *Food poisoning and food hygiene*, 3rd ed. London, Arnold, 1974.

MAURER, Isobel M. *Hospital hygiene.* London, Arnold, 1974.

Reports of the Public Health Laboratory Service

Public Health Laboratory Service Board accounts, 1972–73. *House of Commons Papers* (Session 1973–74), No. 115. London, H.M.S.O., 1974.

Public Health Laboratory Service 1974 Year Book, including annual report for 1973. London, 1975.

Reports of Committees and Working Parties of other organisations to which members of the staff have contributed

BERGEY'S MANUAL EDITORIAL BOARD. *Bergey's Manual of determinative bacteriology*, 8th ed., edited by R. E. Buchanan and N. E. Gibbons. Baltimore, Williams & Wilkins, 1974.

COMMON MARKET SCIENTIFIC VETERINARY GROUP ON SALMONELLOSIS. Comparative studies on salmonella isolations from feeds in ten laboratories, by W. Edel and E. H. Kampelmacher, on behalf of the members of a working group. *Bull. World Hlth Org.*, 1974, **50**, 421.

INTERNATIONAL COMMISSION ON MICROBIOLOGICAL SPECIFICATIONS FOR FOOD. *Microorganisms in foods, 2. Sampling for microbiological analysis: principles and specific applications.* Toronto, University of Toronto Press, 1974.

INTERNATIONAL COMMITTEE ON SYSTEMATIC BACTERIOLOGY. 1st International Congress for Bacteriology. Minutes of meetings, Jerusalem, 1973. *Int. J. syst. Bact.*, 1974, **24**, 375.

Judicial Commission. Minutes of meeting, Jerusalem, 1973. *Ibid.*, 379.

Subcommittee on Numerical Taxonomy. Report, Jerusalem, 1973. *Ibid.*, 396.

Subcommittee on *Enterobacteriaceae*. Minutes of meeting, Jerusalem, 1973. *Ibid.*, 385.

Subcommittee on the Taxonomy of *Leptospira*. Minutes of meetings, Jerusalem and Smolenice, 1973. *Ibid.*, 381. Report (1970–1973), Jerusalem, 1973. *Ibid.*, 383.

Subcommittee on *Moraxella* and allied bacteria. Minutes of meetings, Jerusalem, 1973. *Ibid.*, 394. Report, Jerusalem, 1973. *Ibid.* 395.

Subcommittee on the Taxonomy of *Mycoplasmatales*. Minutes of meeting, Jerusalem, 1973. *Ibid.*, 390.

Subcommittee on the Taxonomy of *Spirochaetales*. Minutes of meeting, Jerusalem, 1973. *Ibid.*, 398. Responsibility for genera, 1973. *Ibid.*, 398.

Luton and Dunstable Hospital. Metronidazole in the prevention and treatment of bacteroides infections in gynaecological patients: report by a study group. *Lancet*, 1974, ii, 1540.

Medical Research Council. Post-transfusion hepatitis in a London hospital: results of two-year prospective study. A report to the M.R.C. Blood Transfusion Research Committee by the Medical Research Council Working Party on Post-Transfusion Hepatitis. *J. Hyg., Camb.*, 1974, **73**, 173.

Pseudomonas Working Party. A study in test reproducibility between laboratories: report of a Pseudomonas Working Party, edited by P. H. A. Sneath and V. G. Collins. *Antonie van Leeuwenhoek*, 1974, **40**, 481.

AWARDS AND EXTERNAL OFFICES ACCEPTED BY MEMBERS OF THE SERVICE DURING 1974

Professor R. E. O. Williams	Member, Advisory Committee on Irradiation of Food.
Mr. J. D. Whittaker ..	CBE in the Birthday Honours.
Professor E. S. Anderson ..	Visiting Professor in Microbiology, Faculty of Medicine, University of Athens.
Dr. Elizabeth A. Hall Asheshov	Honorary Member, Greek Society for Microbiology.
Dr. G. I. Barrow	Member, Sub-Committee on the Taxonomy of *Vibrios*, International Committee of Systematic Bacteriology: Member, Sub-Committee on Microbiological Methods for Water Quality, British Standards Institution; Chairman, Division of Laboratory Medicine, Cornwall Clinical Area.
Dr. R. Y. Cartwright ..	Associate Clinical Tutor, Guildford Medical District.
Mr. C. H. Collins	Member, Department of Health and Social Security Advisory Group for Testing Hepatitis B Antigen; Member, Working Party on Laboratory Use of Dangerous Pathogens (Godber Committee).
Dr. P. B. Crone	Member, Standards and Quality Control Sub-Group, Department of Health and Social Security Laboratory Development Advisory Group.
Dr. Joan R. Davies ..	Chairman, Technical Committee on Medical Specimen Containers, British Standards Institution.
Dr. C. Dulake	Member, Microbiology Committee, Association of Clinical Pathologists; Recognised Teacher, University of London.
Dr. G. L. Gibson	Chairman, Committee on Microbiology, Association of Clinical Pathologists.
Dr. R. J. Gilbert	Member, Microbiological Sub-Committee, North West Thames Regional Health Authority.
Dr. E. H. Gillespie	Vice-President, Association of Clinical Pathologists; Chairman, Pathology Division, Sheffield Northern District Medical Committee; Co-Chairman, Area Pathology Division, Sheffield Area Health Authority (Teaching); Chairman, Advisory Committee on Medical Laboratory Subjects, Sheffield Polytechnic; Member, Academic Division of Pathology, University of Sheffield; Chairman, Study Group on Ethylene Oxide Sterilisation, British Standards Institution.
Dr. E. J. G. Glencross ..	Chairman, Pathology/Radiology, and Honorary Secretary, Peterborough District Medical Committee; Member, Cambridgeshire Area Medical Committee.
Dr. J. V. T. Gostling ..	Member, Editorial Board, Journal of Medical Microbiology; Member of Council, British Journal of Experimental Pathology.
Dr. R. J. C. Hart	Secretary, Sub-Committee on Microbiology, Association of Clinical Pathologists; Member, Technical Methods Committee.

Mr. L. R. Hill	Chairman, Sub-Committee on the Taxonomy of Staphylococci and Micrococci, International Committee on Systematic Bacteriology; Member, Council of Systematics Association.
Dr. Betty C. Hobbs ..	PHLS Representative, Technical Committee on Meat and Meat Products (International), British Standards Institution.
Dr. C. H. L. Howells ..	Secretary, Cambrian Branch, Association of Clinical Pathologists; Member, Council of Association of Clinical Pathologists; Member, Ethics and Professional Affairs Committee, Association of Clinical Pathologists; Member, Panel of Examiners in Medical Microbiology, Royal College of Pathologists; Member, Visiting Panel for the Assessment of Laboratories for Training, Royal College of Pathologists; Member, Welsh Advisory Committee in Pathology; Honorary Lecturer, Department of Microbiology, University of Wales.
Dr. H. H. Johnston ..	Member, Environmental Health Care Planning Team, Oxfordshire; Member, Hygiene Advisory Committee, Automatic Vending Association of Britain.
Dr. J. C. Kelsey	Chairman, Central Sterilising Club; Member, Committee of the Society for Applied Bacteriology.
Dr. S. P. Lapage	Editor, International Code of Nomenclature of Bacteria; Chairman, United Kingdom National Committee of the Commonwealth Collections of Micro-organisms; Chairman, Permanent Committee of the Commonwealth Collections of Micro-organisms; Member, Taxonomic Sub-Committee on *Moraxella* and Allied Organisms, International Committee on Systematic Bacteriology; Member-at-Large, International Committee on Systematic Bacteriology.
Dr. J. H. McCoy	Member, Anglian Water Quality Consultative Group, Anglian Water Authority; Member, Food Composition Quality and Safety Committee, Food Science and Technology Board.
Dr. D. W. R. Mackenzie ..	PHLS Representative, United Kingdom National Committee for Microbial Culture Collections.
Dr. Hélène J. Mair	Clinical Teacher in the Faculty of Medicine, University of Leicester.
Dr. N. S. Mair	Clinical Teacher in the Faculty of Medicine, University of Leicester; Secretary, Sub-Committee on the Taxonomy of Pasteurella, Yersinia and Francisella, International Committee on Systematic Bacteriology.
Dr. J. Marks	Member, Welsh Advisory Committee on Respiratory Diseases; Treasurer, Cardiff Postgraduate Federation in Chest Diseases.
Dr. Rosalind Maskell ..	Associate Clinical Teacher in Renal Medicine, Faculty of Medicine, University of Southampton.
Dr. E. R. Mitchell	Microbiology Representative, Trent Region Scientific Advisory Committee; Chairman, Nottingham Pathology Committee.
Dr. B. Moore	Department of the Environment Representative, EEC Committee on Bathing Water Quality, Brussels; World Health Organisation Expert and Rapporteur, European Delegation on Bathing Water Quality, Bilthoven, Holland; PHLS Representative, Advisory Committee, Council of the Water Research Centre.
Dr. H. D. S. Morgan ..	Chairman, Carmarthen Dinefor District Medical Committee; Consultant Member, Carmarthen Dinefor District Medical Team.
Dr. M. T. Parker	World Health Organisation short-term Consultancy, Republic of Sudan.

Dr. D. J. H. Payne	Member, English Branch Committee, British Society for the Study of Infection.
Mr. R. A. Quaife	Life Membership, Institute of Medical Laboratory Technology; Member, Plastics Laboratory Wear Technical Committee, British Standards Institution.
Dr. L. Robertson	Chairman, Medical Executive Committee; Member, District Management Team.
Dr. B. Rowe	World Health Organization short-term Consultancy on Reference Laboratories, India; Member, World Health Organisation Expert Advisory Panel on Bacterial Diseases.
Mr. M. W. Scruton ..	Member, Technical Committee on Microbiological Safety Cabinets, British Standards Institution.
Dr. C. E. D. Taylor ..	Member of Council, Section of Epidemiology and Preventive Medicine, Royal Society of Medicine.
Dr. G. C. Turner	Chairman, Standing Advisory Committee on Medical Microbiology, Royal College of Pathologists; Member, Advisory Sub-Committee on Laboratory Services, Mersey Regional Health Authority.
Dr. A. T. Willis	Member, Editorial Board, Journal of Antimicrobial Chemotherapy; Chairman, Microbiology Sub-Committee, North West Thames Regional Health Authority; Member, Bedfordshire Southern District Medical Committee.

GRANTS AND OTHER ASSISTANCE RECEIVED OR RENEWED FOR SPECIAL INVESTIGATIONS IN 1974

The Public Health Laboratory Service Board now receive valuable assistance from the Departmental Research and Development Fund of the Department of Health and Social Security. 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 computers for the identification of bacteria.

Laboratory investigations into farmers' lung.

An investigation of laminar flow ventilation and the determination of its effectiveness in protecting hospital patients who are at special risk to cross-infection.

An investigation into hepatitis in a special community.

The establishment of reference facilities for monitoring transferable drug resistance.

The surveillance of whooping cough and B.C.G. vaccines.

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:

$5,000 for the assistance of laboratory research on enteric phage-typing at the International Centre recognised at the Enteric Reference Laboratory, Colindale, London.

$5,000 for the International Shigella Centre recognised at the Salmonella and Shigella Reference Laboratory, Colindale, London.

$5,000 for the International Reference Centre for Staphylococcal Phage-typing recognised at the Cross-Infection Reference Laboratory, Colindale, London.

$4,000 towards the cost of epidemiological serological investigations of tropical sera for antibodies in treponematoses at the Venereal Diseases Reference Laboratory, London Hospital Research Laboratories, London.

$2,000 for research on the bacteriology of leptospirosis at the Leptospirosis Reference Laboratory, London School of Hygiene and Tropical Medicine.

$3,000 for investigations on the microbiology of mycobacteria at the Tuberculosis Reference Laboratory, Cardiff.

(*b*) From the British Diabetic Association:

Dr. D. R. Gamble (Director, Public Health Laboratory, Epsom).

Provision for an investigation into certain aspects of viral pancreatitis, and the part played by viral infection in the development of diabetes, with particular reference to coxsackie virus infection.

(*c*) From the Cancer Research Campaign:

Professor R. E. O. Williams (Director, Bacterial Metabolism Research Laboratory, Colindale).

Provision for research on bacteria in the etiology of cancer of the colon and other sites.

(*d*) From the Wellcome Trust:

Dr. A. D. Pearson (Assistant Microbiologist, Public Health Laboratory, Portsmouth).

Provision towards field work in Norway and Sweden in continuation of research on tularaemia.

Laboratory Directors in 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.

A clause of the Schedule of the Public Health Laboratory Service Act, 1960 permits the Board to accept, hold and administer private gifts on trust for any purpose related to the Public Health Laboratory Service or otherwise connected with bacteriological research. Donations received during 1974 were as follows:

£350 in each of seven years from 1971 to 1977 inclusive, from Ethicon Limited for research in the Cardiff joint Laboratories.

£1,125 from Upjohn Limited for research being undertaken at the Area Public Health Laboratories, Luton and Portsmouth.

£750 from Bath Medical Research Trust in support of research being undertaken at the Area Public Health Laboratory, Bath.

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