TRANSACTIONS

OF THE

ACADEMY OF MEDICINE IN IRELAND.

TRANSACTIONS

OF THE

ACADEMY OF MEDICINE

IN IRELAND.

VOL. V.

EDITED BY

WILLIAM THOMSON, M.A., F.R.C.S.,

GENERAL SECRETARY;

SURGEON TO THE RICHMOND HOSPITAL, DUBLIN.
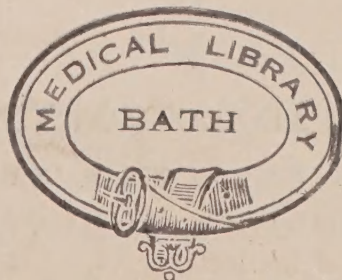
CONTENTS.

MEDICAL SECTION.

SURGICAL SECTION.

SUB-SECTION OF STATE MEDICINE.

SUB-SECTION OF ANATOMY AND PHYSIOLOGY.

LIST OF ILLUSTRATIONS.

ACADEMY OF MEDICINE IN IRELAND.

SESSION 1886-7.

OFFICERS.

President :
ROBERT M'DONNELL, F.R.S., 89 Merrion-square.

General Treasurer :
GEORGE F. DUFFEY, M.D., 30 Fitzwilliam-place.

General Secretary :
WILLIAM THOMSON, F.R.C.S., 34 Harcourt-street.

Secretary for Foreign Correspondence :
JOHN WILLIAM MOORE, M.D., 40 Fitzwilliam-square.

General Council :
ROBERT M'DONNELL, President.
JAMES LITTLE, President of Medical Section.
SIR WILLIAM STOKES, President of Surgical Section.
ARTHUR V. MACAN, President of Obstetrical Section.
WALTER G. SMITH, President of Pathological Section.
GEORGE F. DUFFEY, General Treasurer.
WILLIAM THOMSON, General Secretary.
JOHN WILLIAM MOORE, Secretary for Foreign Correspondence.
A. N. MONTGOMERY, Secretary Medical Section.
WILLIAM THORNLEY STOKER, Secretary Surgical Section.
ANDREW J. HORNE, Secretary Obstetrical Section.
J. B. STORY, Secretary Pathological Section.
*HENRY KENNEDY, } Representatives from Medical Council.
C. J. NIXON, }
W. COLLES, } Representatives from Surgical Council.
ED. HAMILTON, }
T. MORE MADDEN, } Representatives from Obstetrical Council.
WM. ROE, }
J. M. PURSER, } Representatives from Pathological Council.
A. W. FOOT, }

* Dr. R. A. Hayes succeeded the late Dr. H. Kennedy.

Council of Medical Section :

President—JAMES LITTLE, M.D., President King and Queen's College of Physicians.

1. *Secretary*—A. N. MONTGOMERY, 45 Upper Sackville-street.

2. M. A. Boyd,
3. J. Magee Finny,
4. T. W. Grimshaw,
5. Richard A. Hayes,
*6. Henry Kennedy,

7. J. W. Moore,
8. William Moore,
9. C. J. Nixon,
10. Conolly Norman.

Council of Surgical Section :

President—SIR WILLIAM STOKES, President Royal College of Surgeons.

1. *Secretary*—W. THORNLEY STOKER, 16 Harcourt-street.

2. William Colles,
3. C. Coppinger,
4. Henry G. Croly,
5. Kendal Franks,
6. Edward Hamilton,

7. P. J. Hayes.
8. Edward Dillon Mapother,
9. Edward Stamer O'Grady,
10. W. I. Wheeler.

Council of Obstetrical Section :

President—ARTHUR V. MACAN, Master, Rotunda Hospital.

1. *Secretary*—ANDREW J. HORNE, 24 Harcourt-street.

2. Lombe Atthill,
3. John A. Byrne,
4. J. J. Cranny,
5. Professor Dill, Belfast,
6. G. H. Kidd,

7. J. R. Kirkpatrick,
8. R. D. Purefoy,
9. William Roe,
10. T. More Madden.

Council of Pathological Section :

President—WALTER G. SMITH, M.D., Prof. Materia Medica, Trinity College, Dublin.

1. *Secretary*—J. B. STORY, 24 Baggot-street, Lower.

2. C. B. Ball,
3. Wallace Beatty,
4. E. H. Bennett,
5. A. H. Benson,
6. A. H. Corley,

7. Arthur Wynne Foot,
8. T. E. Little,
9. J. M. Purser,
10. J. A. Scott.

* Dr. R. A. Hayes succeeded the late Dr. H. Kennedy

Sub-Section of State Medicine:

Committee:

Chairman—J. W. MOORE, M.D., Physician, Meath Hospital.

1. *Secretary*—E. MacD. COSGRAVE.

2. Sir C. A. CAMERON,
3. J. H. CHAPMAN,
4. T. W. GRIMSHAW,

5. C. F. MOORE,
6. JOHN MURPHY.

Sub-Section of Anatomy and Physiology:

Committee:

Chairman—J. A. SCOTT, Lecturer on Physiology, Carmichael College of Medicine.

1. *Secretary*—J. ST. J. BROOKS.

2. H. BROOMFIELD,
3. D. J. CUNNINGHAM,
4. C. COPPINGER,

5. F. T. HEUSTON,
6. J. M. PURSER.

Committee of Reference:

1. WALLACE BEATTY,
2. E. H. BENNETT,
3. C. COPPINGER,
4. T. E. LITTLE,

5. W. C. NEVILLE,
6. J. M. PURSER,
7. J. A. SCOTT.

HONORARY FELLOWS.

1885 BILLROTH, PROFESSOR T., Vienna.

1885 CHARCOT, PROFESSOR, Paris.

1885 EMMETT, PROFESSOR, New York.

1885*FLINT, PROFESSOR AUSTIN, New York.

1885 HUTCHINSON, MR. JONATHAN, F.R.S., London.

1885 JENNER, SIR WILLIAM, Bart., F.R.S., London.

1885 KEITH, THOMAS, Edinburgh.

1885 KÖLLIKER, PROFESSOR, Würzburg.

1885 LISTER, SIR JOSEPH, Bart., F.R.S., London.

1885 LUDWIG, PROFESSOR, Leipsic.

1885 PAGET, SIR JAMES, Bart., F.R.S., London.

1885 PASTEUR, PROFESSOR, Paris.

1885*SCHRŒDER, PROFESSOR, Berlin.

1885 SIMON, SIR J., F.R.S., London.

1885 VIRCHOW, PROFESSOR, Berlin.

1885 VON RECKLINGHAUSEN, PROFESSOR, Strasburg.

* Dead.

FELLOWS.

[The figures prefixed denote the date of election. The figures appended to Names denote the number of Communications. Original Fellows are marked †].

† ATTHILL, LOMBE, M.D. F.K.Q.C.P., late Master Rotunda Lying-in Hospital, 94 Merrion-square, W.

† AUCHINLECK, HUGH ALEXANDER, F.R.C.S., Lecturer on Forensic Medicine Carmichael School, 35 York-street, Dublin.

† BAKER, ARTHUR WYNDOWE WILLERT, M.B., Ch.M., Surgeon to the Dental Hospital of Ireland, Dental Surgeon to St. Mark's Ophthalmic Hospital, 18 Lower Fitzwilliam-street, Dublin.

† BALL, CHARLES BENT, M.D., F.R.C.S., Surgeon Sir P. Dun's Hospital and Maison de Santé, 16 Lower Fitzwilliam-street, Dublin. [1]

† BANKS, JOHN T., M.D., F.K.Q.C.P., Physician Richmond, Whitworth, and Hardwicke Hospitals, Regius Professor of Physic, Univ. Dub., Physician in Ordinary to Her Majesty the Queen in Ireland, 11 Merrion-square, East, Dublin.

† BARTON, JOHN KELLOCK, M.D., F.R.C.S., Surgeon to the Adelaide Hospital, 24 Lower Fitzwilliam-street, Dublin. [1]

† BARTON, JOHN, M.D., Demonstrator of Anatomy, Carmichael College of Medicine, 26 Upper Merrion-street, Dublin.

† BAXTER, PATRICK CHARLES, M.B., F.R.C.S., Surgeon St. Joseph's Hospital for Sick Children, Demonstrator of Anatomy, Ledwich School, 66 Lower Baggot-street, Dublin.

† BEANEY, Hon. JAMES GEORGE, M.D., F.R.C S. Edin., Surgeon Melbourne Hospital, 154 Collins-street, Melbourne.

† BEATTY, JOSEPH, F.R.C.S., Surgeon Monkstown Hospital, 93 Upper George's-street, Kingstown.

† BEATTY, WALLACE, M.B., Assistant Physician Adelaide Hospital, Medical Officer Throat and Ear Hospital, 21 Lower Leeson-street, Dublin. [1]

† BENNETT, EDWARD HALLARAN, M.D., F.R.C.S., Surgeon to Sir P. Dun's Hospital, Professor of Surgery Trinity College, 26 Lower Fitzwilliam-street, Dublin. [4]

† BENSON, ARTHUR HENRY, F.R.C.S., Ophthalmic Surgeon City of Dublin Hospital, Assistant Surgeon St. Mark's Ophthalmic Hospital, Lecturer on Ophthalmic and Aural Surgery Ledwich School, 42 Fitzwilliam-square, W., Dublin. [2]

† BENSON, J. HAWTREY. M.D., F.K.Q.C.P., Physician City of Dublin Hospital, 57 Fitzwilliam-square, N., Dublin.

† BERNARD, WALTER, F.K.Q.C.P., 14 Queen-street, Londonderry. [1]

† BIGGER, S. LENOX L., F.R.C.S., 8 Harcourt-street, Dublin.

1887 BIRMINGHAM, A., M.B., Professor of Anatomy Catholic University School, Cecilia-street.

† BOYD, MICHAEL AUSTIN, F.R.C.S., Physician Mater Misericordiæ Hospital, 30 Merrion-square, North, Dublin. [2]

1884 BROOKS, H. ST. JOHN, M.B., Demonstrator of Anatomy, Trinity College, 2 Brighton Villas, Bray. [2]

† BROOMFIELD, HUMPHREY JOHN, F.R.C.S., Demonstrator of Anatomy Carmichael College, 30 York-street, Dublin.

1883 BROWNE, J. WALTON, A.B., M.D., Surgeon to the Royal Hospital, 10 College-square, North, Belfast.

† BROWNE, ROBERT, F.R.C.S., Physician Maison de Santé, Largo House, Rathmines-road, Dublin.

1884 BURGESS, JOHN J., L.R.C.S., Assistant Surgeon to the Richmond Hospital, Usher's Island, Dublin.

1884 BURKE, JOHN RICHARD, M.D., Deputy Inspector-General, Hospitals and Fleets, R.N., Assistant Medical Superintendent, Criminal Lunatic Asylum, Dundrum.

† BYRNE, JOHN AUGUSTUS, L.R.C.S., M.B., Gynæcologist to St. Vincent's Hospital, Professor of Medicine and Diseases of Women, Catholic University, 21 Merrion-square, North.

† CAMERON, SIR CHARLES A., M.D., F.R.C.S., Professor of Chemistry Royal College of Surgeons, Superintendent Medical Officer of Health, City and County Analyst, Dublin, 15 Pembroke-road, Dublin. [1]

1884 CHANCE, ARTHUR, L.R.C.S., L.K.Q.C.P., Surgeon to Mater Misericordiæ Hospital, 15 Westland-row.

† CHAPMAN, JOHN HENRY, F.K.Q.C.P., Physician to Hospital for Incurables, Medical Officer Donnybrook Dispensary, South Dublin Union, 122 Pembroke-road, Dublin.

† COLLES, WILLIAM, M.D., F.R.C.S., Surgeon-in-Ordinary to the Queen in Ireland, Regius Professor of Surgery Univ. Dub., Surgeon Dr. Steevens' Hospital, 21 Stephen's-green, N., Dublin.

1883 COOPER, AUSTIN U., F.R.C.S., 39 Plaza Constitucion, Buenos Aires.

† COPPINGER, CHARLES, F.R.C.S., Surgeon to the Mater Misericordiæ Hospital, 11 Upper Merrion-street, Dublin.

1886 CORBAN, L., M.D., Surgeon-Major Army Medical Staff, Dublin.

COWEN, GEORGE, M.B., 78 Pembroke-road, Dublin.

1883 COX, MICHAEL F., M.K.Q.C.P., Physician St. Vincent's Hospital, 45 Stephen's-green, E.

† CORLEY, ANTHONY HAGARTY, M.D., President and Fellow R.C.S., Surgeon to Richmond, Whitworth, and Hardwicke Hospitals, Lecturer on Surgery Carmichael School of Medicine, 16 Merrion-square, Dublin.

† COSGRAVE, E. MacDOWEL, M.D., Physician to Whitworth Hospital, Drumcondra, Demonstrator of Anatomy Ledwich School, 5 Gardiner's-row, Dublin.

† CRANNY, JOHN JOSEPH, M.D., F.R.C.S., Surgeon to Jervis-street Hospital, 17 Merrion-square, N., Dublin.

† CROLY, HENRY GRAY, F.R.C.S., Surgeon City of Dublin Hospital, 7 Merrion-square, N., Dublin. [1]

† CROLY, ALBERT, L.R.C.S., Medical Officer Rathfarnham and White-church Dispensary, Greenfield House, Rathfarnham, Co. Dublin.

1884 CRONYN, JOHN G., L.R.C.S., L.K.Q.C.P., Medical Officer South Dublin Union Workhouse, 4 Clare-street, Dublin.

† CRUISE, FRANCIS RICHARD, M.D., F. & Ex-Pres. K.Q.C.P., Consulting Physician Mater Misericordiæ Hospital, 93 Merrion-square, W., Dublin.

† CUNNINGHAM, D. J., F.R.C.S., F.R.S. Ed., Professor of Anatomy, University of Dublin, 69 Harcourt-street.

† DENHAM, J. KNOX, L.K.Q.C.P., Medical Officer to Donnybrook Dis-pensary, 25 Northumberland-road, Dublin.

† DIGGES, WILLIAM HENRY, L.R.C.P. Edin., 3 Lower Sackville-street, Dublin.

1884 DILL, ROBERT F., M.D., Professor of Midwifery Queen's College, 3 Fisherwick-place, Belfast.

1884 DONNELLY, THOMAS, M.B., Assistant Physician Richmond, Whitworth, and Hardwicke Hospitals, North Frederick-street, Dublin.

† DOYLE, JOSEPH P., L.K.Q.C.P., 69 Lower Mount-street, Dublin. [1]

† DUFFEY, GEORGE FREDERICK, M.D., F.K.Q.C.P., Physician City of Dublin Hospital, Lecturer on Materia Medica Carmichael College, 30 Fitzwilliam-place, Dublin.

1885 DWYER, F. CONWAY, M.D., Surgeon Jervis-street Hospital, 4 Great Denmark-street, Dublin.

† ELLIS, GEORGE, F.R.C.S., M.B., 91 Lower Leeson-street, Dublin.

† EUSTACE, JOHN, M.D., L.R.C.S., Resident Physician Hampstead, High-field, and Elmhurst Lunatic Asylum, Drumcondra, Co. Dublin.

1883 EVANS, WILLIAM R., M.D., L.R.C.S., 29 Molesworth-street, Dublin.

1887 FAGAN, JOHN, F.R.C.S., Surgeon Royal Hospital, 1 Glengall-place, Belfast.

† FINNY, JOHN MAGEE, M.D., F.K.Q.C.P., Physician Sir P. Dun's Hospital, King's Professor of Practice of Medicine, School of Physic, 19 Lower Baggot-street, Dublin.

† FITZGERALD, CHARLES E., M.D., Surgeon-Oculist in Ordinary to the Queen in Ireland, Surgeon to National Eye and Ear Infirmary, 27 Upper Merrion-street, Dublin.

† FITZGIBBON, HENRY, F.R.C.S., Vice-President Royal College of Surgeons, Surgeon City of Dublin Hospital, 18 Lower Fitzwilliam-street, Dublin. [1]

† FITZPATRICK, THOMAS, M.D., 31 Lower Baggot-street, Dublin.

1884 FLEMING, ROBERT H., M.B., Assistant Physician Rotunda Hospital, Dublin. [1]

† FLETCHER, ROBERT VICARS, F.R.C.S., Resident Medical Superintendent District Lunatic Asylum, Ballinasloe, Co. Galway.

† FLINN, DAVID EDGAR, F.R.C.S., Surgeon St. Michael's Hospital, Kingstown, Mount Clarence, Kingstown. [1]

† FOOT, ARTHUR WYNNE, M.D., F.K.Q.C.P., Physician Meath Hospital, Professor of Medicine Royal College of Surgeons, 49 Lower Leeson-street, Dublin. [4]

1886 FOTTRELL, WM. JOSEPH, L.R.C.S., 29 Rutland-square, Dublin.

† FOY, GEORGE MAHOOD, F.R.C.S., Surgeon Whitworth Hospital, Drumcondra, 80 Lower Gardiner-street, Dublin.

† FRANKS, KENDAL, M.D., F.R.C.S., Surgeon to Adelaide Hospital, Surgeon Throat and Ear Hospital, Fitzwilliam-square, Dublin. [2]

† FRAZER, WILLIAM, F.R.C.S., 20 Harcourt-street, Dublin.

1882 FREEMAN, WILLIAM HENRY, L.R.C.P. Lond., F.R.C.S., Surgeon Royal United Hospital, Bath, 24 Circus, Bath.

1884 GARLAND, JOHN, L.R.C S., 23 Arran-quay.

† GOGARTY, HENRY JOSEPH KELLY, F.R.C.S., 5 Rutland-square, E., Dublin.

† GORDON, SAMUEL, M.D., F.K.Q.C.P., Physician to the Richmond, Whitworth, and Hardwicke Hospitals, 13 Hume-street, Dublin.

† GREENE, THOMAS WM. NASSAU, L.R.C.S., Monte Video, South America

† GRIMSHAW, THOMAS WRIGLEY, M.D., F.K.Q.C.P., Registrar-General for Ireland, Priorsland, Carrickmines, Co. Dublin. [1]

1886 GUNN, CHRISTOPHER, M.D., M.K.Q.C.P., Surgeon Jervis-street Hospital, 125 Stephen's-green.

† HAMILTON, EDWARD, M.D., F.R.C.S., Surgeon Steevens' Hospital, Professor of Surgery Royal College of Surgeons, 120 Stephen's-green, W., Dublin. [1]

1884 HAMILTON, J. BUTLER, M.D., Brigade-Surgeon A.M.D., Lucknow.

1886 HAMILTON, J. K., M.D., F.R.C.S., Laura, South Australia.

† HARLEY, ROBERT WILLIAM, L.R.C.S., 21 Pembroke-road, Dublin.

† HAUGHTON, SAMUEL (Clk.), M.D., F.K.Q.C.P., F.R.S., School of Physic, Trinity College, Dublin.

† HAYES, PATRICK JOSEPH, F.R.C.S. Edin., Surgeon Mater Misericordiæ Hospital, Lecturer on Surgery in the Catholic University School of Medicine, 18 Merrion-square, Dublin.

† HAYES, RICHARD ATKINSON, M.D., F.R.C.S., Physician Steevens' Hospital, Physician for Diseases of Throat, National Eye and Ear Infirmary, 32 Merrion-square, South, Dublin.

† HEAD, HENRY HASWELL, M.D., F.K.Q.C.P., Physician to the Adelaide Hospital, 7 Fitzwilliam-square, Dublin.

† HEARN, RICHARD THOMAS, M.B., L.R.C.S., Medical Officer Rathmines Dispensary, South Dublin Union, 7 Belgrave-square, East, Rathmines, Dublin.

† HEMPHILL, WILLIAM D., M.D., F.R.C.S., Surgeon Co. Tipperary Gaol, South Riding, Visiting Physician Clonmel District Lunatic Asylum, Oakville, Clonmel, Co. Tipperary.

† HEPBURN, WILLIAM JOSEPH, F.R.C.S. Edin., Surgeon Meath Hospital and Co. Dublin Infirmary, 31 Upper Merrion-street, Dublin.

† HEUSTON, FRANCIS TYDD, F.R.C.S., Lecturer on Anatomy Carmichael College of Medicine and Surgery, 21 Harcourt-street, Dublin. [1]

† HORNE, ANDREW JOHN, L.K.Q.C.P., late Assistant Physician Rotunda Hospital, 24 Harcourt-street, Dublin.

1883 JACOB, DAVID, M.D., F.R.C.S., Surgeon Queen's County Infirmary, Visiting Physician Maryborough District Lunatic Asylum, Surgeon Queen's County Prison, Port Leix, Maryborough, Queen's Co.

1885 JENNINGS, ULICK A., M.D., Brigade Surgeon, M.S., Retired, Cork.

† JEX-BLAKE, SOPHIA, M.D., M.K.Q.C.P., Lecturer on Hygiene London School of Medicine for Women, Bruntsfield Lodge, Whitehouse Loan, Edinburgh.

† JONES, HENRY MACNAUGHTON, M.D., F.R.C.S., 141 Harley-st., London.

1886 JOYNT, C., M.D., Deputy Surgeon-General, Army Medical Staff, Retired, Claremount, Carrickmines.

1884 KELLY, J. BELLEW, M.D., F.R.C.S., 27 Lawrence-street, Drogheda.

† KENNEDY, HUGH, B., L.R.C.S., 1 Gardiner's-place, Dublin.

† KENNY, JOSEPH E., M.P., L.R.C.P. Edin., Medical Officer North Dublin Union Workhouse, 15 Rutland-square, Dublin.

1884 KIDD, FRED. W., L.R.C.S., Assistant-Master Coombe Hospital, 17 Lower Fitzwilliam-street, Dublin.

† KIDD, GEORGE HUGH, F.R.C.S., M.D., late Master and Obstetric Surgeon Coombe Lying-in Hospital, Consulting Obstetric Surgeon to the House of Industry Hospitals, 30 Merrion-square, South, Dublin.

1886 KIDDLE, W., Surgeon Army Medical Staff, Dublin.

† KINKEAD, RICHARD JOHN, M.D., L.R.C.S., Lecturer on Medical Jurisprudence, Professor of Obstetric Medicine, Queen's College, Galway, West House, Galway.

† KIRKPATRICK, JOHN RUTHERFORD, F.K.Q.C.P., Professor of Midwifery, T.C.D., 4 Upper Merrion-street, Dublin. [1]

1882 KNIGHT, CHARLES FREDERICK, M.D., M.Ch. Q.U.I., M.A.O., R.U.I., Physician Mercer's Hospital, Lecturer on Practice of Medicine and Pathology Ledwich School of Surgery, 51 Harcourt-street, Dublin.

† KNOTT, JOHN FREEMAN, F.R.C.S., Demonstrator of Anatomy, School of Surgery, 34 York-street, Dublin.

1884 KOUGH, EDWARD, M.A., M.B., Rhosygar, Monkstown, Co. Dublin.

1885 LANE, JOHN LILLY, M.B., late Assistant Physician, Rotunda Hospital, 37 Lower Baggot-street, Dublin. [1]

1884 LAPPER, EDWIN, L.K.Q.C.P., Lecturer on Chemistry Ledwich School of Medicine, 2 Knapton-villas, Kingstown.

1884 LEDWICH, EDWARD L'E., L.R.C.S., Lecturer on Anatomy, and on Practical Physiology and Institutes of Medicine, Ledwich School of Medicine, 31 Harcourt-street, Dublin.

† LENTAIGNE, JOHN VINCENT, F.R.C.S., Surgeon Mater Misericordiæ Hospital, Demonstrator of Anatomy Carmichael College, 29 Westland-row, Dublin.

† LITTLE, JAMES, M.D., F.K.Q.C.P., Physician Adelaide Hospital, 14 Stephen's-green, North, Dublin.

† LITTLE, THOMAS EVELYN, M.D., L.R.C.S., University Anatomist, and Surgeon to Sir Patrick Dun's Hospital, 42 Great Brunswick-street, Dublin.

1884 LUSH, WILLIAM VAUDREY, M.D., M.R.C.P., F.R.C.S. Eng., Physician to the Dorset County Hospital, 12 Frederick-place, Weymouth.

† MACAN, ARTHUR V., M.B., M.A.O., F.K.Q.C.P., Master Rotunda Hospital, Dublin.

1887 MACAUSLAND, J., L.R.C.S., Resident Surgeon Steevens' Hospital, Dublin.

† M'ARDLE, JOHN STEPHEN, L.R.C.S., Surgeon St. Vincent's and the Mullen Convalescent Home, 7 Merrion-street, Upper, Dublin. [1]

1886 MacCORMAC, SIR WILLIAM, M.A., F.R.C.S., Surgeon to St. Thomas's Hospital, 13 Harley-street, London.

† M'CULLAGH, JOHN, L.R.C.S., Demonstrator of Anatomy, Catholic University, Ireland, 68 Mountjoy-square, West, Dublin.

† McDONNELL, JOHN, M.D., F.R.C.S., 32 Upper Fitzwilliam-street, Dublin.

† McDONNELL, ROBERT, M.D., Surgeon Steevens' Hospital, Surgeon Jervisstreet Hospital, 89 Merrion-square, West, Dublin.

1886 M'DOWELL, FRANCIS VICTOR, M.B., F.R.C.S., Surgeon Baltinglass Union Infirmary, St. Kevin's, Baltinglass. [1]

1887 M'KEE, ALEXANDER BAILLIE, M.B., Curator Museum, Royal College of Surgeons, Dublin.

1883 M'KEOWN, WILLIAM A., M.D., Surgeon Eye and Ear Infirmary, 20 College-square, East, Belfast.

† M'LAREN, AGNES, M.D., L.K.Q.C.P., Physician Canongate Medical Mission Dispensary, Bruntsfield Lodge, Whitehouse Loan, Edinburgh.

1886 M'MORDIE, WM. K., M.D., Physician Samaritan Hospital for Women and Children, 17 College-square, East, Belfast. [1]

† MacSWINEY, STEPHEN MYLES, M.D., F.K.Q.C.P., Physician Jervisstreet Hospital, Professor of Medical Jurisprudence Catholic University, 9 Upper Merrion-street, Dublin.

† M'VEAGH, JOHN FRANCIS, M.D., Physician to Reformatory High Park, and Children's Hospital, 1 Rutland-square, East, Dublin.

† MADDEN, THOMAS MORE, M.D., F.R.C.S., Edin., M.K.Q.C.P., Obstetric Physician Mater Misericordiæ Hospital, Physician to St. Joseph's Hospital for Sick Children, 55 Merrion-square, South, Dublin. [2]

1884 MANLY, B. C., L.R.C.S., Aberdeen House, Clyde-road, Dublin.

† MAPOTHER, EDWARD DILLON, M.D., F.R.C.S., Consulting Surgeon St. Vincent's Hospital, Consulting Medical Officer of Health City of Dublin, Professor of Physiology Royal College of Surgeons, 6 Merrion-square, North, Dublin.

1883 MARQUEES, LAURENCE, L.R.C.S., Assistant-Surgeon Civil Hospital, Hong Kong, Pereira, Macao, China.

† MARTIN, JAMES, F.R.C.S., Medical Officer Portlaw Dispensary, Carrick-on-Suir Union, Medical Officer Portlaw Fever Hospital, Portlaw, Co. Waterford.

† MARTIN, WILLIAM JAMES, M.D., F.R.C.P. Edin., Physician Jervis-street Hospital and St. Joseph's Infirmary for Children, 17 Harcourt-street, Dublin.

† MASON, SAMUEL ROBERT, M.B., F.R.C.S., Master Coombe Hospital, Lecturer on Midwifery Ledwich School, 92 Harcourt-street, Dublin. [1]

† MASON, THOMAS PETER, M.B., F.R.C.S., Physician Mercer's Hospital, Lecturer on Anatomy Ledwich School, 74 Harcourt-street, Dublin.

1885 MAXWELL, PATRICK W., M.B., Ophthalmic Surgeon Steevens' Hospital, Assistant Surgeon National Eye and Ear Infirmary, 16 Warmington-place.

† MELDON, AUSTIN, F.R.C.S., Surgeon Jervis-street Hospital, 15 Merrion-square, North, Dublin.

1883 MIDDLETON, WILLIAM HENRY, L.R.C.S., Surgeon Westmeath Co. Infirmary, Mullingar, Co. Westmeath.

† MINCHIN, HUMPHRY, M.B., F.R.C.S., Medical Officer North Dublin Union Workhouse, Surgeon City of Dublin Prisons, 56 Lower Dominick-street, Dublin.

1885 MOLONY, JOHN, M.K.Q.C.P., Master St. Patrick's Hospital for Lunatics, Dublin. [1]

† MONTGOMERY, ROBERT, M.R.C.S. Eng., 4 Gardiner's-row, Dublin.

† MONTGOMERY, ALEXANDER NIXON, M.K.Q.C.P., Secretary Vaccination Department, Local Government Board, 45 Upper Sackville-street, Dublin.

† MOORE, CHARLES FREDERICK, M.D., F.R.C.S., Medical Officer No. 3 Dispensary, South Dublin Union, 10 Upper Merrion-street, Dublin.

† MOORE, JOHN WILLIAM, M.D., F.K.Q.C.P., Physician Meath Hospital, Physician Cork-street Fever Hospital, 40 Fitzwilliam-square, West, Dublin. [1]

† MOORE, ROBERT HENRY, F.R.C.S., Surgeon-Dentist-in-Ordinary to His Excellency the Lord Lieutenant, 29 Upper Merrion-street, Dublin.

† MOORE, WILLIAM, M.D., F.K.Q.C.P., Physician to Her Majesty the Queen and to Sir Patrick Dun's Hospital, 67 Fitzwilliam-square, North, Dublin.

1887 MOUILLOT, FRANCOIS ALBERT DE THIERRY, M.B., Medical Officer Work- house, Gorey. [2]

1883 MURPHY, JOHN, L.R.C.S., Assistant Physician Mater Misericordiæ Hospital, 14 Gardiner's-place, Dublin.

† MURPHY, JOHN JOSEPH, L.R.C.P. Ed., 18 Harcourt-street, Dublin.

1886 MYLES, T., F.R.C.S., Surgeon Jervis-street Hospital, Demonstrator Anatomy Trinity College, Dublin, 32 Harcourt-street, Dublin.

† NEVILLE, WILLIAM COX, M.D., M.A.O., late Assistant Physician Coombe Lying-in Hospital, 71 Lower Baggot-street, Dublin.

1883 NEWELL, F. T. PORTER, L.R.C.S., Resident Surgeon Meath Hospital.

† NIXON, CHRISTOPHER J., M.D., F.K.Q.C.P., Physician to Mater Miseri- cordiæ Hospital, 2 Merrion-square, N., Dublin. [1]

† NIXON, FREDERICK ALCOCK, F.R.C.S., Surgeon Mercer's Hospital, 33 Harcourt-street, Dublin.

† NOLAN, ANDREW O'KELLY, F.R.C.S., Gort, Co. Galway.

1885 NORMAN, CONOLLY, F.R.C.S., Medical Superintendent Richmond District Lunatic Asylum, Dublin. [1]

1886 NORTON, JOHN J., L.K.Q.C.P., Emly, Tipperary.

† NUGENT, GUY PERCIVAL L'ESTRANGE, M.B., Physician Richmond, Whit- worth, and Hardwicke Hospitals, Demonstrator of Anatomy School of Physic, Trinity College, 4 Upper Mount-street, Dublin.

† O'CARROLL, JOSEPH FRANCIS, M.B., L.R.C.S., Assistant Physician Rich- mond, Whitworth, and Hardwicke Hospitals, 27 Westland-row, Dublin.

1887 O'FLAHERTY, R. G., M.B., Medical Officer No. 1 Dispensary District, 101 Upper George's street, Kingstown.

† O'GRADY, EDWARD STAMER, F.R.C.S., Surgeon Mercer's Hospital, 33 Merrion-square, North, Dublin.

1883 O'KEEFE, PATRICK, M.D., Resident Medical Officer Mountjoy Prison, Dublin.

1883 OLPHERTS, J. WYBRANTS, M.D., Medical Officer Downpatrick Dispensary District, The Villas, Downpatrick.

1883 O NEILL, WILLIAM, M.D., M.R.C.P. Lond., Physician Lincoln Lunatic Hospital, 2 Lindum-road, Lincoln.

† ORMSBY, LAMBERT HEPENSTAL, F.R.C.S., Surgeon Meath Hospital, Surgeon National Orthopædic and Children's Hospital, 4 Merrion- square, West, Dublin.

† O'SULLIVAN, STEPHEN, M.D., F.R.C.S., Professor of Surgery, Queen's College, Cork, Surgeon North Infirmary, 6 Camden-place, Cork.

† OULTON, HENRY W., M.D., L.R.C S , 6 North Frederick-street.

† PALMER, JOSEPH MANSERGH, F.R.C.S., Surgeon Armagh County Infirmary, Co. Infirmary, Armagh.

† PATTON, ALEXANDER, M.B., Resident Physician Farnham House and Maryville Private Lunatic Asylum, Farnham House, Finglas, Dublin.

† PEARSALL, WILLIAM BOOTH, F.R.C.S., 13 Upper Merrion-street, Dublin.

1887 PEARSON, CHARLES YELVERTON, M.D., F.R.C.S. Eng., Professor of Materia Medica Queen's College, 1 Sydney-place, Cork.

† PECHEY, MARY EDITH, M.D., L.K.Q.C.P., Cumballa Hill, Bombay.

1885 PETIT, JOSEPH, L.K.Q.C.P., Medical Superintendent District Lunatic Asylum, Sligo.

† POOLE, J. SEALEY, M.D., late Assistant-Master Coombe Lying-in Hospital, Dublin, 24 College-gardens, Belfast.

† POLLOCK, JAMES FERRIER, M.D., F.K.Q.C.P., Medical Officer Meath Industrial Schools, Avoca House, Blackrock.

† POPE, FREDERICK ALEXANDER, M.B., Surgeon Dublin Throat and Ear Hospital, 63 Pembroke-road, Dublin.

1886 PORTER, CHARLES F., L.R.C.S., Colac, Victoria, Australia.

† PORTER, SIR GEORGE HORNIDGE, M.D., F.R.C.S., Surgeon-in-Ordinary to the Queen in Ireland, Surgeon Meath Hospital, 3 Merrion-square, Nth., Dublin.

1885 POTTER, HENRY, F.R.C.S., Brigade Surgeon Indian Army, 33 Belgrave-square, Rathmines, Dublin.

† POWELL, GEORGE DENNISTON, M.D., 76 Upper Leeson-street, Dublin.

† PRATT, JOSEPH DALLAS, M.B., Medical Registrar, City of Dublin Hospital, 25 Lower Fitzwillian-street, Dublin.

† PURCELL, THOMAS, M.K.Q.C.P., Medical Officer and Medical Officer of Health, No. 1 South City Dispensary, South Dublin Union, 71 Harcourt-street, Dublin.

† PUREFOY, RICHARD DANCER, F.R.C.S., Obstetrical Surgeon Adelaide Hospital, 13 Merrion-square, Dublin.

† PURSER, JOHN MALET, M.D., F.K.Q.C.P., Professor of Institutes of Medicine in the School of Physic, Physician Sir Patrick Dun's Hospital, 3 Wilton-terrace, Dublin. [1]

† QUINLAN, FRANCIS JOHN BOXWELL, M.D., F.K.Q.C.P., Physician St. Vincent's Hospital, Professor of Materia Medica and Therapeutics Catholic University, 29 Lower Fitzwilliam-street, Dublin.

† REDMOND, JOSEPH MICHAEL, F.K.Q.C.P., Physician to Mater Misericordiæ Hospital, Lecturer on the Practice of Medicine and Pathology in the Ledwich School of Medicine, 8 Clare-street, Dublin.

1886 ROBINSON, CHARLES H., F.R.C.S., M.K.Q.C.P., Lecturer on Anatomy Ledwich School, 35 Harcourt-street, Dublin. [1]

† Roe, William, M.D., F.R.C.S., Obstetric Physician National Lying-in Hospital, Professor of Midwifery Royal College of Surgeons, 13 Lower Fitzwilliam-street, Dublin.

† Scott, Charles Mason, L.R.C.S., Rockingham, Kingstown, Co. Dublin.

† Scott, John Alfred, L.K.Q.C.P., Lecturer on Physiology, Carmichael College, 55 Upper Leeson-street, Dublin. [2]

† Scott, William, M.D., F.R.C.P., Edin., Physician to Aughnacloy Hospital, Aughnacloy, Co. Tyrone.

† Shannon, Peter, M.D., F.R.C.S., 91 Stephen's-green, South, Dublin.

1886 Smith, Alfred J., M.B., Assistant-Master Rotunda Hospital, 26 Upper Mount street, Dublin.

† Smith, Walter George, M.D., F.K.Q.C.P., King's Professor of Materia Medica School of Physic, and Physician to Sir Patrick Dun's Hospital, 34 Lower Baggot-street, Dublin. [1]

† Smyly, Philip Crampton, M.D., F.R.C.S., Surgeon Meath Hospital, Surgeon to the Hospital for Throat and Ear Diseases, 4 Merrion-square, North, Dublin.

† Smyly, William Josiah, M.D., F.R.C.S., Obstetric Physician City of Dublin Hospital, 56 Fitzwilliam-square, Dublin.

† Stack, Richard Theodore, D.M.D., Harvard, F.R.C.S., Dental Surgeon Adelaide Hospital, Surgeon to Dental Hospital of Ireland, 10 Westland-row, Dublin.

† Stoker, William Thornley, M.D., F.R.C.S., Surgeon Richmond Hospital, Surgeon Swift's Hospital for Lunatics, Professor of Anatomy Royal College of Surgeons, Ireland, 16 Harcourt-street, Dublin. [1]

† Stokes, Sir William, F.R.C.S., Surgeon Richmond Surgical Hospital, Professor of Surgery Royal College of Surgeons, 5 Merrion-square, North, Dublin.

† Story, John Benjamin, M.B., F.R.C.S., Surgeon St. Mark's Ophthalmic Hospital, 24 Lower Baggot-street, Dublin. [1]

† Swan, Robert Lafayette, F.R.C.S., Surgeon Dublin Orthopædic Hospital, Stephen's-green, N., Dublin.

† Swanzy, Henry Rosborough, M.B., F.R.C.S., Surgeon National Eye and Ear Infirmary, Dublin, Ophthalmic Surgeon Adelaide Hospital, 23 Merrion-square, North, Dublin. [1]

1884 Tate, Davis D., M.D., Resident Medical Officer, North Dublin Union.

1885 Tait, Lawson, F.R.C.S. Eng., Surgeon Birmingham and Midland Hospital for Women, 7 The Crescent, Birmingham.

† Thomson, William, F.R.C.S., Surgeon Richmond Hospital, 34 Harcourt-street, Dublin. [1]

† Tobin, Richard Francis, F.R.C.S., Surgeon St. Vincent's Hospital, 59 Stephen's-green, Dublin.

1886 Truell, H. P., M.B., J.P., Clonmannon, Ashford, Co. Wicklow.

† Tweedy, Henry Colpoys, M.D., F.R.C.S., Physician Steevens' Hospital, 2 Gardiner's-row, Dublin.

† Usher, Isaac William, L.R.C.S., Medical Officer Dundrum No. 1 Dispensary, Rathdown Union, Tudor House, Dundrum, Co. Dublin.

† Ward, Montgomery Albert, M.D., F.R.C.S., Surgeon to Mercer's Hospital, Physician to Maison de Santé, 9 Rathmines-road, Dublin.

† Wharton, James H., M.B., F.R.C.S., Surgeon Meath Hospital, Hospital for Incurables, 28 Upper Merrion-street, Dublin.

† Wheeler, William Ireland, M.D., F.R.C.S., Surgeon City of Dublin Hospital, 32 Merrion-square, North, Dublin. [3]

1883 Williams, David Mark, L.K.Q.C.P., M.R.C.S.E., Physician Liverpool Hospital for Consumption and Diseases of the Chest, 63 Shaw-street, Liverpool.

† Wright, Edward Perceval, M.D., F.R.C.S., Professor of Botany and Keeper of Herbarium Dublin University, Kilrock House, and Howth, 5 Trinity College, Dublin.

† Wright, W. McDowel Aikin, M.B., L.R.C.S., Medical Officer Killiney Dispensary, Rathdown Union, 6 Ulverton-place, Dalkey, Co. Dublin.

1884 Yourelle, M. J., M.K.Q.C.P., 42 Morehampton-road.

MEMBERS.

1885 BEWLEY, HENRY, M.B., Lower Baggot-street, Dublin. [1]

† BOYCE, Jos. W., M.B., Medical Officer Blackrock Dispensary District, Blackrock, Co. Dublin.

1887 BYRNE, LOUIS A., L.K.Q.C.P., L.R.C.S., 36 North Circular-road, Dublin.

† DAVYS, FRANK J., F.R.C.S., Medical Officer Swords and Donabate Dispensary and Constabulary, Swords, Co. Dublin.

† DELAHOYDE, J. O'CONNELL, L.R.C.S., Medical Officer No. 2 District, North Dublin Union, 55 Rutland-square, Dublin.

1884 DILLON, PAUL ROBERT, L.K.Q.C.P., 7 Cavendish-row, Dublin.

1887 ELLIOTT, GEO. BLACKER, L.R.C.S., Resident Surgeon Richmond Hospital, Dublin.

1884 FALKINER, NINIAN M., M.B., Lecturer on Chemistry Carmichael School of Medicine, 28 York-street, Dublin.

1883 FERGUSON, H. L., F.R.C.S., New Zealand, care of M. Ferguson, Esq., 81 James's-street, Dublin.

1885 FETHERSTON, R. H., M.B., 9 Gladstone-terrace, The Meadows, Edinburgh.

1885 GIBBS, RICHARD, L.R.C.S., Medical Officer Coolock Dispensary District, Winstonville, Fairview, Co. Dublin.

1884 GORDON, S. T., M.B., The Depot, Phœnix Park, Dublin.

1886 GORDON, ALEX., L.K.Q.C.P., 18 Rathmines-road, Dublin.

1884 HADDEN, DAVID R. H., L.R.C.S., 8 Castlewood-avenue, Dublin.

1883 KENNA, DENIS P., L.R.C.S., 114 Great Britain-street, Dublin.

1885 KENNEDY, J. M. PRIOR, L.R.C.S., 25 Lower Baggot-street, Dublin.

1887 LENNON, E. E., L.K.Q.C.P., Assistant Physician Meath Hospital, 30 Harcourt-street, Dublin.

1883 M'DERMOTT, P. A., F.R.C.S., 85 Upper George's-street, Kingstown.

† MORROGH, GEORGE, M.D., United Service Club, Dublin.

† MYLES, WM. ZACHARY, L.F.P.S., Glasgow, Assistant Medical Superintendent, Richmond Lunatic Asylum, Dublin.

1883 MYLES, THOMAS W., L.R.C.P. Ed., Resident Apothecary, House of Industry Hospitals, Dublin.

1885 O'FLAHERTY, Richard George, M.B., 101 Upper George's-street, Kingstown.

1885 O'NEILL, E. J., M.D., 6 Cavendish-row, Dublin.

† OWENS, SIR GEORGE B., M.D., 126 Lower Baggot-street, Dublin.

1886 REDMOND, T. O'CONNELL, L.K.Q.C.P., 22 Victoria-street, South Circular-road, Dublin.

1885 RIDLEY, GEORGE P., L.R.C.S., L.K.Q.C.P., 14 Upper Leeson-street, Dublin.

1885 RUTHERFORD, WM., M.D., F.R.C.P. Edin., Visiting Physician District Lunatic Asylum, Ballinasloe.

1884 SCOTT, J. H., L.R.C.S., Surgeon Adelaide Hospital, 89 Harcourt-street, Dublin.

1885 SHAW, JAMES, L.R.C.S., 93 Talbot-street, Dublin.

† SPEEDY, ALBERT O., L.R.C.P. Ed., Medical Officer, No. 3 Dispensary District, North Dublin Union, 28 North Frederick-street, Dublin.

1884 STRAHAN, MICHAEL, L.R.C.S., Medical Officer, No. 2 North City Dispensary District, 38 Rutland-square, Dublin.

1886 TATE, D. D., junr., L.K.Q.C.P., Assistant Medical Officer Mountjoy Convict Prison, Dublin.

† TAYLOR, ALEX., M.D., L.K.Q.C.P., 3 Botanic-view, Glasnevin.

† WHITE, WM. DUDLEY, L.R.C.S., Medical Officer, No. 3 Dispensary District, North Dublin Union, 51 Rutland-square, Dublin.

1887 WILLIS, THOS., M.D., 34 Upper Ormond-quay, Dublin

1886 YEATES, G. W., M.B., Lower Baggot-street, Dublin.

STUDENT ASSOCIATES.

BEWLEY, ALFRED W., Dublin.

COX, STAFFORD, Richmond Hospital.

CREMIN, WM., Richmond Hospital.

DELACHEROIS, E. B., 26 Stephen's-green.

GORE, W. R., Richmond Hospital.

GREY, J., Dublin.

HILL, J. R., 15 Lower Gloucester-street.

JACKSON, R. W., 17 Trinity College.

KIDD, LEONARD, Richmond Hospital.

MATSON, J. AGAR, Dublin.

NICKSON, WILFRID, Weston, Booterstown.

REDMOND, J. J., Dublin.

SCULLY, J., Dublin.

RULES.

1. The name shall be, "ACADEMY OF MEDICINE IN IRELAND."

Constitution.

2. The Academy shall consist of Fellows, Honorary Fellows, Members, and Student Associates.

Management.

3. The affairs shall be managed by a Council, consisting of the President, the four Presidents of Sections, the General Secretary, the Treasurer, four Secretaries of Sections, and eight Councillors, being two representatives from each Sectional Council.

Meetings.

4. The Meetings shall be General and Ordinary.

Publication of " Transactions."

5. The "Transactions" shall be published by the Council, subject to the provisions hereinafter contained.

Original Fellows and Members.

6. All the Members of the present Societies (Surgical, Medical, Obstetrical, and Pathological) shall be Original Fellows or Members, without entrance fee, on payment of the annual subscription on or before 31st December, 1882.[a]

Fellows.

7. Fellows of the King and Queen's College of Physicians in Ireland, and of the Royal College of Surgeons in Ireland, shall be admitted, without ballot, on payment of the entrance fee and the subscription for the current year. All others, being registered Medical Practitioners not directly or indirectly engaged in the sale of drugs, shall be proposed by two Fellows, and elected by ballot by the Council.

8. Candidates shall be proposed at one Meeting of the Council, and balloted for at the next ; one black bean in four to reject.

Privileges of Fellows.

9. Fellows only shall be eligible for office in the Academy. They shall have the privilege of attending all Meetings of the Academy, of making Communications, and of voting and speaking at such meetings. They shall also receive a copy of the "Transactions."

---

[a] Those who have paid a Life Subscription to any of the above Societies will be admitted to the privilege of Fellows on payment of Member's subscription.

10. These privileges shall not be exercised by any Fellow in arrear with his subscription.

Honorary Fellows.

11. Honorary Fellows, limited in number to 25, may be nominated by the Council, and elected, on motion at a General Meeting of the Academy by a majority of at least two-thirds of those present and voting.

Members.

12. Any Registered Medical Practitioner may be elected as a Member, the election to be conducted in the same manner as that of Fellows.

Privileges of Members.

13. Members shall have the privilege of attending the Ordinary Meetings of the Academy, of making Communications, and of taking part in debate. They can purchase the " Transactions " at cost price.

Student Associates.

14. Registered Medical Students, of the third or subsequent years, may be elected as Student Associates in the same manner as the Members.

15. Student Associates shall have the privilege of attending the ordinary Meetings of the Academy.

Annual Subscription.

16. Fellows shall pay £2 2s., and Members £1 1s. Student Associates shall pay 5s. The Subscription shall become due on the 1st of October in each year, and if the Subscription be not paid on or before the first Meeting in February, the defaulter shall cease to belong to the Academy, unless the delay shall be accounted for to the satisfaction of the Council. No Fellow shall vote at the Annual General Meeting who has not paid his subscription for the year. Medical Officers of the Army and Navy, and registered Medical Practitioners not residing within 15 miles of Dublin, are eligible as Fellows of the Academy on payment of the entrance fee, and an annual Subscription of £1 1s.

Entrance Fee.

17. After admission of Original Fellows, all Fellows shall pay an entrance fee of £1 1s.

Council.

18. The Council shall meet on the first Wednesday in the month throughout the Session, or oftener should they see occasion ; five to form a quorum.

19. Notice of all Extraordinary Meetings shall be transmitted by the Secretary to every Member of the Council. The President or any five Members of Council may call an Extraordinary Meeting of the Council. The Council shall determine questions by vote, or division if demanded, the President having a casting vote only. Any regulation of the Council shall have the force of a law, until submitted to the next General Meeting. The Council shall have the power of filling up any vacancies which may occur in the list of Officers of the Academy, except that of President, before the Annual General Meeting.

Sectional Councils.

20. There shall be four Sectional Councils elected by the Annual General Meeting in October, termed respectively—the Surgical, the Medical, the Obstetrical, and the Pathological, Council.

21. No Fellow shall be eligible as a candidate for election on more than one Sectional Council.

22. Each Sectional Council shall consist of the President of the Section and ten Members, one of whom shall act as Secretary to the Section.

Meetings of Sectional Councils.

23. Each Sectional Council shall meet on a fixed day at least one week before the Ordinary Meeting of their Section, three to form a quorum.

Powers.

24. Each Sectional Council shall have the power of making any such arrangements as it thinks necessary to carry on the work of the Ordinary Meetings which are under its charge, provided that such arrangements do not interfere with the general laws of the Academy ; and any Rules laid down by such Council shall have the force of laws at the Ordinary Meetings under its charge, until submitted to the General Council.

25. Each Sectional Council shall have the power of filling up any vacancies that may occur among its Members until the Annual General Meeting.

Committee of Reference.

26. The Council shall appoint a Committee of Reference, to report upon morbid growths and other specimens exhibited before the Academy ; of this Committee the Exhibitor shall, for the occasion, be a Member.

Officers.

27. A President to be elected by the Annual General Meeting in October, and to hold office for three years.

28. The Presidents of the Colleges of Physicians and Surgeons for the time being shall be the Presidents of the Medical and Surgical Sections. The Presidents of the Obstetrical and Pathological Sections shall be elected by the Fellows at the Annual General Meeting in October.

29. (1.) One General Secretary to be elected at the Annual General Meeting.

    (2.) It is expedient that a fixed salary (of one hundred guineas) shall be paid yearly to the general Secretary in consideration of the fact that the editing of the "Transactions" is part of his duties.

30. One General Treasurer to be elected at the Annual General Meeting.

31. One Honorary Secretary for Foreign Correspondence to be appointed by the Council.

32. The Councillors for each Section to be elected at the Annual General Meeting in October. Each Sectional Council shall elect two Members to act on the General Council.

33. Two Members in each Sectional Council shall retire annually, and be ineligible for re-election for one year.

34. Four Secretaries, one for each section, to be appointed by the Sectional Councils.

35. That any Fellow desirous of nominating a candidate for election on any of the Sectional Councils shall, at least one fortnight before the Annual General Meeting, forward an application to the General Secretary to enter the name of such Fellow on the list of candidates for the office of Councillor of that Section, provided that the Fellow so nominated shall have consented to act (passed 1886).

36. That all elections shall be by ballot.

Duties of Officers.

37. *The President* shall preside at the Annual and Special General Meetings and at General Council Meetings. In the absence of the President the senior Member of Council then present shall preside.

38. *The Presidents of Sections* shall preside at the Ordinary Meetings of the Academy, and shall also preside at the Sectional Council Meetings. In the absence of the President, the senior Member of the Sectional Council present shall preside.

39. *The General Secretary* shall attend all General Meetings of the Academy and General Council. He shall take minutes of such meetings, to be read at the following meeting.

40. He shall receive and have charge of all papers intended for publication in the "Transactions" of the Academy, after they have been handed over to him by the Secretaries of the several Sections.

41. He shall, on receiving notice from the Secretary of a Section, send out to all the Members notices of the title or titles of the paper or papers for the next Ordinary Meeting, with the name or names of the authors, and, so far as possible, of the subjects for Exhibition, with the names of the Exhibitors.

42. He shall arrange for the Exhibition of specimens and the reading of papers, which are forwarded to the Academy by those who are absent, or are not members.

43. The Treasurer shall receive all moneys, and lodge the same in bank to the account of the Academy, and all cheques shall be signed by the Treasurer and one other Councillor.

44. The Accounts shall be audited by two Fellows, not Members of Council, to be appointed by the President at some meeting previous to the Annual Meeting.

Duties of Secretaries of Sections.

45. To attend the Meetings of the Council of the Section and the Ordinary Meetings of the Academy, under the management of said Council, and to take minutes at such meetings, to be read at the next following meeting of that section.

46. To keep such papers as the Sectional Councils deem worthy of publication, for the purpose of handing them over to the General Secretary.

47. To inform the Secretary of the Committee of Reference of any specimens referred to that Committee, and to transfer the specimens to that Secretary.

48. To give notice to the General Secretary, one week previous to the meeting, of the titles of papers for the evening, the names of the authors, and, so far as possible, the objects for Exhibition, with the names of Exhibitors, so that the General Secretary may inform the Members.

Meetings.

49. The Annual General Meeting to take place on the last Friday in October, for the election of Officers and Members of Council, and for the general business of the Academy.

50. Due notice of the meeting shall be given by the Secretary to all members one fortnight previously, and the names of Candidates proposed for office must be in the hands of the Secretary one week before the meeting.

51. No motion involving a change of these Rules shall be brought before this meeting except one week's notice thereof shall have been given by the Secretary to each Member.

52. The President may, and shall, on receiving a requisition signed by seven Fellows, at any time, on giving one week's notice, forthwith summon a Special General Meeting, for the consideration of particular business, the nature of which must be specified in the letter of summons convening the meeting, and at such meeting no other business can be transacted.

Ordinary Meetings.

53. The communications to be submitted to the Ordinary Meetings shall be grouped under the following heads :—Medical, Surgical, Pathological, and Obstetrical ; and the conduct of such meetings shall be in the hands of the several Sectional Councils, each Sectional Council to have the management of the Ordinary Meeting in regular rotation ; the Council of the Pathological Section to have charge of the first meeting in each Session ; that of the Surgical of the second ; that of the Medical of the third ; and that of the Obstetrical of the fourth ; and so on until the end of the Session.[a]

54. The Ordinary Meetings shall be held on every Friday evening, from the first Friday in November until the last Friday in May, inclusive, at eight o'clock, except during the Christmas and Easter recesses.

55. All Fellows, Members, and Student Associates attending the meetings, shall write their names in the attendance book.

56. Any Fellow or Member may introduce two Visitors by cards obtained from the Sectional Secretaries.

57. Officers of the Army or Navy Medical Departments shall, on presenting their cards, be admitted to the Ordinary Meetings of the Academy.

58. No communication shall exceed twenty minutes in its delivery, nor any speech thereon ten minutes, except by permission of the Chairman. No one shall speak twice upon the same communication, except the author, who has the right of reply.

[a] NOTE.—With the permission of the Colleges, the Sectional Meetings in Surgery and Pathology will be held in the Royal College of Surgeons; those in Medicine and Obstetrics in the King and Queen's College of Physicians.

Sub-Sections.

59. A Sub-section in Anatomy and Physiology, under the direction of the Surgical and Medical Sections, and a Sub-section in State Medicine, under the direction of the Medical Section, shall meet during the session, as may be arranged by the Councils of each Section.

59*a.* The election of the Committee and Chairman of the various Sub-sections of the Academy of Medicine shall take place in October, and be conducted in the same manner as is adopted in the selection of the Sectional Councils (passed 1886).

60. The Sub-sections shall have each a Chairman and Committee of six Members, of whom one shall act as Secretary.

Ordinary Meetings.—Order of Business.

61. (1.) Chair to be taken at 8.30 p.m.

(2.) Chairman to read list of specimens, &c., exhibited by card, together with the names of the Exhibitors.

(3.) No Pathological Specimen shall be exhibited at any section other than the Pathological and Obstetrical, except by card. This Exhibition shall not exclude any subsequent communication regarding it at the Pathological Section.

(4.) There shall be no Exhibition of Specimens by card in the Obstetrical or Pathological Sections.

(5.) Any member shall have liberty to exhibit any recent specimen at any of the meetings of the Obstetrical Section, provided it illustrates any question in gynæcology.

(6.) At the meetings of the Obstetrical Section recent specimens may be exhibited, and the President shall invite discussion thereon, provided that such exhibition of specimens or discussion, if any, thereon, must terminate at 9 o'clock, p.m., but that, if necessary, they may be resumed after the papers for the evening have been read and discussed.

(7.) Chairman to ask if any member has any observations to make or motion to propose relative to any living specimen on the List of Exhibition.

(8.) Chairman to call upon the author of the first paper on the list to read his paper.

(9.) Chairman to call upon members to discuss the paper, or, at his discretion, to take any other paper or papers on the list relating to the subject, and have the discussion subsequently on all such papers collectively.

(10.) When the last paper has been discussed, the Chairman to ask if any member desires to speak upon any of the specimens exhibited by card.

(11.) After the discussion upon any specimen, the Exhibitor has the right of reply.

Regulations regarding the Exhibition of Specimens by Card.

62. (1.) Any member may exhibit by card at any Ordinary Meeting, except at the meeting of the Pathological and Obstetrical Sections. At the meetings of the Pathological all specimens must be presented and described *viva voce*, and debate may be invited thereon.

(2.) Notice shall, if possible, be given to the General Secretary, or the Secretary of the Section, on or before the previous Ordinary Meeting.

(3.) Specimens must be in the room at 7.45 on the night of Exhibition.

(4.) Specimens for Exhibition by card shall be open for inspection at 8 p.m.

(5.) A card, containing all particulars for publication, shall be placed with the Specimen. Cards for this purpose are to be obtained from the Secretary.

(6.) The Exhibitor should be present, and he shall furnish further details if asked for.

(7.) Every Exhibitor shall submit the Specimen or Specimens on view to the Committee of Reference, if the meeting so decide.

Exhibition of Pathological Specimens.

63. No lengthened reference to treatment shall be allowed upon any Specimen, except by the express permission of the Chairman.

Bye-laws concerning " Transactions."

64. The " Transactions " shall consist of such Communications made to the Academy by or through Fellows or Members as may be deemed by the General Council suitable for publication ; also, of discussions of importance or interest arising out of such Communications.

65. All Communications accepted by the Academy become the property of the Academy, but authors may also print their Communications in any publication in addition to the "Transactions." Papers shall be handed to the Secretary of the Section immediately after they have been read.

66. The "Transactions" for the year shall be presented to all Fellows of the Academy who have paid their Annual Subscriptions.

67. The " Transactions " may be purchased by Members at cost price.

68. That the Publication Committee of each Section do meet not later than the Tuesday after each meeting of the Section, for the purpose of abstracting the proceedings—the abstract to be placed in the printer's hands on same evening, and forwarded to the editors of medical journals not later than Thursday afternoon.

69. That contributors of papers be requested to send their papers to the Academy printer early enough to allow of their being put in type before the meeting, and read in proof ; that when one sheet of the "Transactions" has been completed it be printed off and laid aside until the termination of the session, and then bound up in the volume of "Transactions."

70. That on the evening of the day of meeting of the Sectional Council, when the papers for the next meeting have been decided upon, a circular be sent to each contributor informing him :—

> (1.) That he is expected to be ready or else take his place at the bottom of the list.

> (2.) That he must have an abstract ready with his paper, otherwise he will be noted in the published proceedings in such form as the Publication Committee think fit.

> (3.) The General Council is empowered to defray the expenses in whole or in part of any illustrations which it may consider advantageous to the elucidation of the papers published by the Academy.

71. That an abstract (prepared by the author) of each communication made at the Academy, along with a report of the discussions thereon, shall be furnished to the editors of such medical journals as may desire to publish them, and that the authors of such communications shall be empowered to publish their papers *in extenso* in any periodical or periodicals they may think fit, such communications also to appear in the "Transactions," provided the Council consider them worthy of insertion.

Expulsion of Fellow or Member.

72. Expulsion of a Fellow or Member can only take place at a General Meeting of the Academy, on the motion of the Council, if two-thirds of the Members present shall vote for the same by ballot. Of such ballot the Council must give at least fourteen days' notice in writing to every Fellow of the Academy.

New Laws.

73. New Laws, or alterations in existing Laws, can only be proposed at the Annual General Meeting in October. Any Fellow proposing such alteration shall give notice to the General Secretary at least ten days before the General Meeting in October.

ANNUAL REPORT.

THE Fourth Year of the Academy of Medicine in Ireland
has now closed; and the continued vigour which charac-
terises its work affords satisfactory proof of the greater
power derived from the recent junction of the Medical
Societies. The "Transactions" continue to be highly spoken
of in the Medical Journals; the list of Fellows and Members
remains at a high standard, and the General Council record
with peculiar gratification a good financial balance.

The Fellows, Members, and Student Associates number
212, 33, and 15, as compared with 211, 35, and 24 re-
spectively, in 1884-5. The falling off in the number of
Student Associates is to be regretted, and the Council
urgently press upon the Fellows to induce the best pupils
to become early associated with the Academy.

At the last General Meeting a Resolution was passed,
directing the Council to consider the propriety of investing
some portion of the available balance; and this matter has
been very carefully gone into. The Council have acted
under the direction of their legal adviser, Mr. Gordon,
and they have now to report that the sum of £375 has
been invested in Irish Consolidated Annuities (3 per cent.),
in the names of R. M'DONNELL (President), G. F. DUFFEY
(Honorary Treasurer), and WM. THOMSON (General Secre-
tary), as Trustees, "to be sold, transferred, or otherwise
disposed of by them, when, and as the Council of the
Academy shall, by order entered upon the minutes of its
proceedings, at any time, or from time to time direct."

The desirability of publishing in the "Transactions" an abstract of the discussions on papers read in the Sections was brought before the Council, and a Committee was appointed to consider the subject. The Report approved of the principle, and stated that an additional sixty pages added to the volume would cost about £10. The General Council, however, did not deem it advisable to adopt the Report. Rule 64 empowers the Council to publish "discussions of importance or interest arising out of" the communications made to the Academy; and the Council will exercise that authority when occasion arises.

The proposed visit of the British Medical Association to Dublin, in August, 1887, was brought before the General Council in a letter from DR. NEVILLE, Secretary of the Dublin Branch, and it was unanimously resolved to send a letter of invitation to the President and Council of the Association.

On the motion of Mr. EDWARD HAMILTON, seconded by SIR WM. STOKES, President of the College of Surgeons, it was agreed to submit the following recommendation to the General Meeting of the Academy for approval:—

> "The Council recommend that the Honorary Treasurer be authorised to contribute out of the Funds of the Academy a Sum of One Hundred Guineas, towards the expenses of the Annual Meeting of the British Medical Association in Dublin, in 1887."

Signed,

ROBERT M⸴DONNELL, M.D., F.R.S.,
President.

W. THOMSON, M.A., F.R.C.S.,
General Secretary.

TREASURER'S REPORT.

RECEIPTS.	£	s.	d.
To Balance in Bank, 23rd October, 1885 -	385	3	1
,, Subscriptions, &c. - - -	453	19	6
,, Half-Year's Dividend on Consols -	5	7	1
Total Receipts -	**£844**	**9**	**8**

EXPENDITURE.	£	s.	d.
General Secretary's Salary - -	105	0	0
Printing, Stationery, Postage, &c. -	224	9	5
Illustrations in "Transactions" -	20	11	2
Reporters - - -	47	0	0
Attendants at Meetings -	19	0	0
Tea, Coffee, Cakes, &c., at Meetings -	20	17	0
Sundries - - -	4	2	6
	441	0	1
Subscriptions overpaid refunded -	10	10	0
Purchase of £369 6s. 0d. Three per Cent. Consols at 101, including interest for 51 days and commission	375	0	0
Balance - - -	17	19	7
	392	19	7
Total Expenditure -	**£844**	**9**	**8**

We have examined the Treasurer's Statement of the Accounts of the Academy of Medicine for the Session 1885-86, and we find it correct.

C. J. NIXON, M.D., } Auditors.
KENDAL FRANKS, M.D., }

GEO. F. DUFFEY, *General Treasurer.*

October 16th, 1886.

TRANSACTIONS

ACADEMY OF MEDICINE IN IRELAND.

MEDICAL SECTION.

NARCOLEPSY (SUDDEN PERIODICAL SLEEP-SEIZURES).

By ARTHUR WYNNE FOOT, M.D. Trin. Coll. Dubl.;

Professor of Practice of Medicine, Royal College of Surgeons;
Senior Physician, Meath Hospital, &c., &c.

[Read in the Medical Section, November 19, 1886.]

THE term Narcolepsy, which may possibly be unfamiliar to some, is the name under which M. Gélineau [a] described, in 1880, a rare form of neurosis characterised by an irresistible desire to sleep, sudden in its onset, lasting but a short time, and recurring at more or less prolonged intervals. For ten years I had kept buried in my note-books a curious case of morbid somnolence taking the form of periodic sleep-seizures, which I was at a loss how to describe until I long afterwards met with the name narcolepsy, which is so appropriate that it seems to me to be the disease so named by M. Gélineau.

The subject of the curious affection I am about to describe was a young gentleman, aged eighteen, with a history of no illness previous to the present, except an attack of measles. His appearance was what would be called healthy; he was $9\frac{1}{2}$ stones in

---

[a] In a communication made to the Academie des Sciences, 7 Juin, 1880. Reprinted, with additions, as a thesis (pp. 77) in 1881.

weight; 5 feet 8 inches in height; was of a dark complexion; his eyes were lustrous and rather prominent; he had a good colour in his cheeks; his expression was candid and intelligent. He did not use alcohol, opium, or tobacco, and I came to the conclusion that his statements as to his being unacquainted with any form of sexual indulgence were to be regarded as truthful. He was fond of books and music, liked mixing with company, and was a good amateur sailor. His residence at Waterford gave him full opportunities to gratify his love for boating.

He was brought to me in the month of December, 1874. He said he came to get cured of a sleepiness from which he had been suffering for a year and a half. This sleepiness came on every day at the same hour, between 2 and 3 o'clock, whether he was sitting, standing, or walking about, and quite irrespective of meal times. He felt it coming on, and was sensible of its approach, but powerless to resist it. Unless he was forcibly roused from it by pulling, shaking, or shouting at him, it continued for two or three hours, when it disappeared gradually. While in the sleepy state he can perform automatic movements, but in an imperfect manner. If it comes on while he is speaking or writing, he talks incoherently or writes nonsense; the pen is apt to drop from his hand when writing, and the knife and fork at dinner, when the sleep-seizure takes him. When overtaken by it walking in the street he can usually find his way home, but has lost his way, and has been observed to walk unsteadily and knock up against people. When in the somnolent state he can see and hear, but not distinctly. He says he is annoyed by the way people look at him in a railway carriage, the motion of which will make him fall asleep at other times as well as in the afternoons, so that he has frequently been carried past the station he intended to get out at. Coming across the river at Waterford he has stepped out of the boat into the water before he had reached the landing slip. Even the excitement of sailing his boat single-handed did not prevent the sleep coming on at its usual hour, and he has beached his boat on a tidal slob, and had to remain there for hours, when out sailing by himself, from not minding what he was about. He falls asleep

at the piano in the middle of a piece of music. The effect of forcible disturbance of his sleep was to produce such irritability and passionate excitement that his family did not resort to it, but let him sit or lean back in a chair till it passed off. *There was never any form of convulsion or spasm observed to attend the sleepiness.*

This state of things had been going on for a year and a half before I saw him, and continued with little variation for three years, during which I saw or heard from him frequently. He referred its commencement to a particularly warm day in May, 1873. He had been exposed to the sun all this day, and the sleep seized him while sitting under a tree. So natural an occurrence did not strike him as at all surprising; he continued to get sleepy daily about the same hour, yet did not become uneasy about it till a year had elapsed. He was then for some time under the care of the late Dr. Cavet, of Waterford, who gave him bromide of potassium, and also tried to avert the attacks by quinine, without effect. When I saw him in December, 1874, there had been only two days in the preceding six months on which he had not had sleep attacks.

There were several marked neurotic traits in this young man's family history. He had an aunt who was imbecile, and a younger sister subject to epileptic fits, and who was under the care of Sir Dominic Corrigan. One of his brothers at nine years of age became silent, and after remaining so for six months began to speak again, and continued to do so in his usual manner. The cause of this boy's silence seemed to be connected with some emotional disturbance. There was a story in the family of an apparition having appeared to him, which told him that the best way to avoid telling a lie was not to speak at all. At first this boy used to repeat the same sentence three or four times; then he ceased speaking altogether. He did not even make an exclamation. For instance, when one day, on getting out of bed, he trod upon a needle, which ran into his foot, he said nothing, but merely removed it. He was quite sensible, and in playing cards his family used purposely to play unfairly with the object of surprising him into some observation, but they always failed to make him

speak. Suddenly, after six months' silence, on his mother one day entreating him to speak to her, he commenced to do so in his usual manner.

In addition to this neurotic history the patient exhibited some proofs of a very mobile nervous system, in the great acceleration of the heart's action which occurred upon his visits to me, though it quieted down after a short time. On these occasions re-duplication of the first sound would occur, frequently a systolic apex murmur, always great rapidity of action. He told me he has felt a hot flush run along each side of the neck when he rang the hall-door bell. He had what is called a "bad head for heights," could not look over a cliff or go up a ladder, was easily made giddy or sick, therefore could not dance or go in a swing. He was invariably sea-sick whenever he went outside the smooth water of Waterford harbour into the open sea, although he had been all his life accustomed to sailing.

In speaking of the treatment I may be very brief, inasmuch as he derived no permanent benefit from anything I could suggest. The use of leeches behind the ears occurred to me because he had a sensation of weight in the head before the sleepiness fell on him, and because he had occasional epistaxis to a moderate amount, but especially because I was aware of a case of what I would now call narcolepsy, whose convalescence was believed to date from a sharp attack of epistaxis. Leeches behind either ear alternately were ordered once a week; he was also put on full doses of liq. ext. ergotæ, and a combination, in pill, of belladonna, digitalis, and oxide of zinc. After four weeks of this treatment he reported that he had escaped the afternoon attack on three different occasions—first for one, then for two, and then for three days—intermissions longer than had ever occurred before. He was in great delight, and thought he was cured; but after the three-day respite the attack returned on the fourth day. A medical friend who was observing him in Waterford wrote me that the prominence and lustre of his eyes were lessened, and his complexion was less florid; also that he had had some sickness of stomach—probably from the ergot. In the midsummer of 1875 he took ten-grain doses of

quinine after breakfast on three consecutive days. On the first two days no attack of sleep came, but an incomplete one occurred on the third day—that is, he did not actually fall asleep, but became so drowsy he had to lay down a book he was reading. The dose of quinine was then increased to 15 grains every day after breakfast. This had the effect of postponing the attacks to the evenings; they were also lighter, as he was able to struggle against them and partially stave them off. He writes at this time—"The sleepiness, I fear, is not quite driven away yet, but I find it much easier to overcome it." In a very short time he found the drowsiness attacked him whether he took the quinine or did not. He used to omit it sometimes, because he had directions not to take it on days on which he had any headache. The quinine was abandoned, and he was then put on 8-minim doses of Fowler's solution, three times a day, after meals. After a month of this treatment he was no better. On one occasion while taking the arsenic he had a discharge of urine during the sleeping fit. Such a thing had never happened before, and he was greatly concerned about it. He had seminal emissions about once a week at night, but never during the day sleeps. He had never had nocturnal enuresis.

Early in 1876 headaches became more frequent, and he began to complain of extremely vivid dreams at night. He then tried drachm doses of liquid extract of guarana after breakfast and at 2 p.m., just before the time of the seizure. He tried this for a month without benefit. He had previously been often given strong tea or coffee to keep him awake, but they failed to do so. In March of this year (1876) he began to exhibit an unusual degree of irritability when coming out of the sleepy state; he was snappish and cross to everyone to a degree which he used afterwards regret. He now began to feel a sensation in his right wrist, when awakening, "like an electric shock." In May (1876) he went to London, and consulted Dr. Russell Reynolds, who ordered him dilute nitro-muriatic acid with taraxacum and calumba. After using this for three weeks without result, he saw him again, and was put on a mixture of ergot of rye and hypophosphite of

soda. The sleepiness was worse in London than it had been anywhere else. The next time I saw him (September, 1877) was more than a year after his visit to London. He was still just as much subject to the attacks as before, and was, in addition, disturbed in his sleep at night by "horrible dreams," and by a frequent sensation of some one holding him by the hand, which made him feel very uncomfortable, as he knew there was no one in the room. He now noticed a point in the back of his head, about the apex of the lambdoidal suture, which felt sore and tender to touch or pressure before the sleep came on.

I have lost sight of the case since the end of 1877. From inquiries made, I believe his family have left this country, and gone to live abroad.

In an article on Epistaxis, by Mr. Rawdon Macnamara,[a] there is so clear a case of narcolepsy that it will be excusable to refer to it in connection with the present case. It was that of a young lady, aged about fifteen. The most remarkable feature in the case, and that for which he was consulted, was the suddenness with which she would fall into a state of profound sleep. Sitting in her chair, in the midst of a conversation apparently of the highest interest for her, in the middle of a sentence, her chin would drop forward on the sternum, and she was in a profound slumber—so profound that the loudest *noise* could not disturb her, but, the *slightest touch*, and she would start up as wide awake as if she never had been asleep. The same phenomenon would occur at her meals ; in the midst of the process of mastication, with the morsel still in her mouth, suddenly would she drop off asleep ; and many was the time that her relatives dreaded lest she would thus be choked. Coming down stairs she would lean up against the wall and be off to sleep. The catamenial period had presented itself a few months previously, and in that respect everything was normal. But perhaps the most painful scene was to witness her at the piano (she was highly educated, and for years an accomplished musician). On more than one occasion her aunt would ask her to play for her some piece or other of music ; the first few

---

[a] Dubl. Quart. Jour. Med. Sci. Vol. XXXIII., p. 39. 1862.

pages would be played with great spirit and accuracy, but when she came to the last page or so one could easily recognise the struggle with which the performance was carried on, and the last few bars were painful beyond description, from the slow, laboured effort with which she concluded the piece—then a deep sigh, and then she was once again fast asleep. This state of affairs continued for some time, becoming each day, if possible, worse. Her convalescence dated from a rather sharp attack of epistaxis, which occurred after the repeated application of leeches in different directions about the head, by which means depletion had been carried on as far as it was judged that it could be done with prudence.

Under the heading Lethargy, Dr. Graves describes a case of this affection which is not included in the fourteen cases M. Gélineau has been able to collect. Dr. Graves writes:[a] —" I know a gentleman advanced in life and of plethoric habits, who has been for several years affected with lethargic symptoms, but without any headache, tendency to paralysis, or impairment of his general mental energies. He is frequently attacked, however, even at his meals, with unconquerable sleepiness, and it is surprising how suddenly it comes on; thus he will be sitting, talking quite cheerfully, and unexpectedly he drops into a sleep, which lasts for about half a minute or a minute, and then he arouses himself and continues awake for a few minutes longer. This happens so often that he cannot now venture to go into company. This drowsiness comes on so quickly that at one meal he has broken three or four glasses by becoming unconscious after the act of filling the glass, and during the time he was raising it to his mouth. He was consequently obliged to have an attendant to watch him going to bed, lest he might fall asleep in an inconvenient place or position, or might endanger the safety of the house by allowing the candle to fall."

On the present occasion I will offer but a few remarks, and will make them with the utmost brevity. And first, as to the nomenclature of the disease, I would suggest, though with no desire to supplant it, that "hypnolepsy" would be a more expressive term.

[a] Dubl. Quart. Jour. Med. Sci. Vol. XI., p. 4. 1851.

In narcolepsy the word νάρκη means a becoming stiff—numbness, deadness, such as would be caused by palsy, frost, fright—and can only indirectly have the secondary meaning of quiescence from sleep, whereas the word ὕπνος conveys no idea of rigidity or numbness, but only that of ordinary sleep.

Secondly, this is quite a different affection from the sleeping sickness (*maladie du sommeil*) of the tropics,[a] and which is almost endemic on the western coast of Africa; for this latter is almost invariably fatal, exclusively attacks the black population, and is usually associated with glandular swellings in the neck.

Thirdly, from epilepsy, to which at first sight it may seem to be related, it has remarkable points of difference—in there being neither tonic spasms nor clonic movements, in the preservation of common sensation, and in the consciousness, to a certain degree, of what is going on around. It is also noteworthy, in reference to this point, that neither picrotoxin nor the inhalation of nitrite of amyl has proved of any more service in this affection than has caffein or the valerianate of caffein.

In a paper read before the New York Neurological Society in March, 1884, Dr. C. L. Dana thus classifies the different forms of "Morbid Somnolence"—Epileptoid sleeping states; Hysteroid sleeping states (including trance, lethargy, and mesmeric sleep); and Narcolepsy; which form of morbid somnolence he regards as the expression of a distinct neurosis.

[a] See Irish Hospital Gazette, January, 1874, p. 14; and British Medical Journal, January 2, 1875, p. 5.

A CASE OF MYXŒDEMA.

By C. J. NIXON, M.B., LL.D. Univ. Dubl.;

Fellow of the College of Physicians ; and Senior Physician, Mater
Misericordiæ Hospital.

[Read in the Medical Section, November 19, 1886.]

A few years ago, through the courtesy of Dr. Ord, I had an opportunity of seeing some cases of myxœdema which were under his observation in St. Thomas's Hospital. The symptoms of this disease are so characteristic and so uniform in their occurrence that it may, ordinarily, be recognised *de visu*. At first the œdematous condition might be regarded as an evidence of renal or cardiac disease; but the history of the case, the characters of the œdema, the peculiar facies, the mental and nervous symptoms present, and the atrophied condition of the thyroid gland—all constitute an affection of a specific and distinctive type. I am not sure that any example of myxœdema was ever brought before the members of my profession here—hence I thought an instance of it of sufficient interest to bring before the Medical Section of the Academy. The notes are compiled from particulars furnished to me with great care and accuracy by my resident, Mr. Thomas Carr :—

Case.—Anne P., aged forty, married, was admitted into hospital on the 1st of November last. She is the mother of seven children, two of whom died in infancy from croup; the surviving children are strong and healthy. The family history is a satisfactory one; her parents, brothers, and sisters, being free from disease; there is no syphilitic taint in the case.

Until three years ago the patient's health was exceptionally good. About this time she began to suffer from profuse menstruation, which recurred at intervals of three weeks during a year, and subsequently at intervals of six weeks. The discharge usually lasted for eight days. Some time after the menstrual disturbance had set in she noticed, and her friends remarked, a change in the

expression of her face. It got very broad, her lips became thick and pendulous, and she experienced a difficulty in speaking and in making herself understood by others. Her voice became thick and guttural, and she had a difficulty in raising it. She next noticed that her hands became swollen, quite rough, altered in appearance, and clumsy in movements. She found a difficulty in sewing, in making some home-made bread, and in writing. Her memory became defective, particularly with regard to recent events: if she read a book or a newspaper, and left down either, she entirely forgot what she had been just reading about. She, moreover, had a great difficulty in adding figures together, although before her illness she was rather quick in this respect. Getting frightened about her altered appearance and the general condition of her health, she presented herself for admission to the hospital.

The points noted upon examination of the case were as follows :— The appearance of the patient is peculiar. The face is broad and pale, except under the malar bones, where there is a delicate circumscribed flush of a roseate character, which becomes greatly brightened in colour under excitement. The eyelids are distinctly puffy, but do not pit readily on pressure, and there is some sub-conjunctival œdema present. The skin of the face generally is white, shining in appearance, and, under the eyelids, porcellaneus in aspect. Under the chin it is loose and flabby, whilst, corresponding to the posterior triangles of the neck, there is on each side a large boggy swelling, apparently consisting of an aggregation of adipose tissue. The lips are large, blubber-like, and pendulous ; they are moved with some difficulty ; and the face generally is devoid of expression—during laughter it is idiotic in aspect. The nose is thick, and the alæ nasi are considerably expanded. The tongue is somewhat large when protruded, and the soft palate is pendulous and wanting in tone. The gums are extremely soft and spongy, the breath is fœtid, and the back teeth have been lost—in the lower jaw there are only six teeth. There is considerable swelling of the hands, legs, feet, and of the skin over the back ; but the œdema is of a solid character, and does not pit upon pressure. The hands present somewhat the spade-like appearance described by Sir William Gull, and the skin on the back of them is rough and scale-like in character. The skin throughout the body is dry, in parts furfuraceous, and shows no evidence of the exercise of a sudoriferous or sebaceous function. The hair of the head, and that on the pubes, has become extremely

thin; and in the axillæ there is no vestige of hair observable. Hair is absent generally over the surface of the skin, except on the posterior aspect of the cheeks, which are covered by long downy hair. There appears to be a complete absence of the thyroid gland. There is no enlargement of the liver or spleen, and the digestive system appears to be normal. The urine is pale in colour, occasionally deposits pale-coloured urates, is of a specific gravity of 1020, acid in reaction, and free from albumen and sugar. It presents nothing abnormal on microscopic examination. Dr. Cruise kindly made a quantitative estimation of the amount of urea present, according to Esbach's method. There are only five grammes per litre—a little over two grains to the ounce.

The impulse of the heart is feebly marked, the first sound ill-defined, and the second aortic sound is sharply accentuated. It is difficult to form any opinion as to the state of the arteries from the existence of the œdema. The radial pulse is weak and compressible, and usually at the rate of 76 beats in the minute. The sphygmogram [submitted] represents its characters, which are not peculiar.

A careful examination of the blood in reference to the number of corpuscles was kindly made for me by Dr. Scott with Ziess's hæmatocytometer. The red cells number only 3,000,000 to the cubic millimetre; the white cells are increased to the proportion of one in twenty.

The patient's temperature has been, whilst under observation, always subnormal, ranging from 95·8° to 97·8° F.; it never reached 98°. She invariably feels cold, even during summer, and is obliged to wear very warm clothing.

The nervous symptoms noted were—a slow and somewhat tottering gait; common sensibility is blunted, and a feeling of pins and needles is occasionally complained of in the back. The tendon reflexes are exaggerated, especially in the upper limbs; the superficial reflexes appear to be lost. She is nervous, especially when walking on a wet floor, or crossing over a small drain or ridge in the country. It has been remarked of her by the other patients in the ward that she is very slow in understanding what is said to her, slow and deliberate in replying to questions or in doing anything that she is asked to do. Her disposition is quiet and tranquil in the extreme, and she is a favourite with her companions in the ward. She is particularly drowsy, having an almost constant desire to sleep.

All the special senses, according to the patient's own statement, are impaired. She has suffered from buzzing or roaring in the ears, but this condition does not now exist. Sight is fairly good, but, with prolonged use, becomes weak. The examination of the discs and retinæ disclosed nothing abnormal.

For the past month or two she complains of an ugly smell coming, apparently, from her throat, and she remarks that this has now become constant in existence.

There has been difficulty in eliciting these particulars, as the patient's intelligence is of a low type, and she is apt to contradict herself when questioned repeatedly upon the symptoms of her disease.

The members of the Academy who have had an opportunity of examining the patient exhibited will readily recognise the condition faithfully pourtrayed by Sir William Gull,[a] in his paper on " A Cretinoid State Supervening in Adult Women." The outline of the face ; the smooth and fair texture of the skin, with its porcellaneus aspect in parts ; the thick spade-like hands ; the swelling of the lips and alæ nasi ; the mild and gentle expression, with a mind evincing a placid and lazy indifference to surrounding circumstances—are the peculiar features to be noted. Sir William Gull further calls attention to the polysarcia which accompanies the condition described. In this paper there is no attempt made to establish a pathological basis upon which to found a theory of the disease. But, apart from the interest attached to the description of a set of symptoms at once novel and obscure, it suggests the possibility of a connection between the cases observed and cases of sporadic cretinism, reported by Dr. Hilton Fagge as occurring in certain parts of England. In these latter cases there are, as in those noted by Sir William Gull, the peculiar alteration of the face, the thick blubber lips, the coarse hands, the defective intelligence, and the mild and tranquil disposition.

Dr. Fagge,[b] in his account of sporadic cretinism, dwells upon signs which are of some significance. Firstly, that the cases are associated with atrophy of the thyroid gland ; and, secondly, that soft lobulated tumours, the size of a hen's egg, are found on each

[a] Trans. Clin. Soc. Vol. VII.
[b] Medico-Chirurgical Transactions. 1871.

side of the neck in the posterior triangles. So far, a certain obscure relation seems to be established between cretinism of the sporadic form and the condition described by Sir William Gull, but the connection between this state and myxœdema, or the relation which atrophy of the thyroid gland holds to the latter—as effect or cause—is not touched upon.

Before, however, pointing out the relation of myxœdema to atrophy or absence of the thyroid gland, I may incidentally remark that the weight of evidence is strongly in favour of goître and cretinism being the effects of the same unknown cause. Although the Sardinian Commission on Cretinism and Goître reported, in 1845, that these diseases were essentially distinct, and that their frequent co-existence in the same locality was due to a simple coincidence, Eodéré and Tourdes, most competent observers, show that both diseases owe their origin to the same cause, and are closely connected by hereditary influences; whilst Baillarger, in his work on goître and cretinism, points out that three-fourths of cretins are goîtrous, and that the gradual destruction of the thyroid gland by disease develops the cretinous condition. A protective influence against cretinism through the existence of a thyroid gland cannot, however, be conceded, until the state of the gland in cases where goîtres exist is determined, it being well known that goître may involve complete destruction of the gland tissue. So far as our present knowledge goes, I believe I am correct in stating that the nexus between thyroid atrophy and cretinism has not been clearly established.

Much more determinate, however, is the relation of myxœdema to atrophy or ablation of the thyroid gland. Dr. Ord, whilst naming this disease from the special changes found in the connective tissue of the skin, points out the constant association of these changes with atrophy or absence of this gland. This distinct view of the nature of the disease is all the more important, in consequence of a similar train of symptoms to those described by Dr. Ord, being described by Charcot under the name of Cachéxie Pachydermique,[a] and by Köcher, of Berne, as Cachexia Struma

[a] Le Progrès Médical. June, 1880.

Priva. Both Reverdin and Köcher found that as a result of removal of the thyroid gland for goître, a condition of solid œdema was produced, with the development of a cretinous condition of mind.

Perhaps no better illustration of the practically useful effects of carefully conducted vivisection experiments is afforded than by those showing the effects of removal of the thyroid gland in animals. Schiff, Wagner, and the Italian observers, Sanguirico and Canalis, have shown that, after ablation of the thyroid gland, the animals operated on became idiotic and died in a comatose condition. More recently Professor Victor Horsley[a] has, with extreme care and ability, noted the conditions following extirpation of the thyroid gland in the monkey. The gland was removed in such a way as to obviate the effects of hæmorrhage, and to avoid, as far as was possible, injury to any of the nerves in its vicinity. The symptoms produced are very remarkable, and coincide in all important particulars with the symptoms noted after removal of the thyroid gland in man by Reverdin and Köcher. The monkeys experimented upon developed tremors, gradual weakness of the limbs, anæmia, œdema well marked in the eyelids, and an apathetic and listless condition which ended in complete imbecility. They finally died in a state of coma. The *post-mortem* examination revealed the myxœdematous change in the tissues in a remarkable degree, as shown by the table submitted :—

Table of Analysis of the Tissues, showing the amount of Mucin before and after Thyroidectomy in the Monkey. By W. D. HALLIBURTON, M.D.

	Skin and Subcutan. Tissues	Tendon	Muscle	Parotid Gland	Submaxillary Gland	Blood
I. Normal—						
Monkey (*a*) - -	·89	·39	0	—	—	0
,, (*b*) - -	·9	·5	0	0	·01	0
II. Abnormal, after Thyroidectomy—						
No. 1 lived 55 days -	3·12	2·55	0	·72	6·0	·35
,, 3 ,, 32 ,, -	—	—	—	—	—	—
,, 5 ,, 49 ,, -	2·3	2·4	Trace	1·7	3·3	0·8
,, 10 ,, 7 ,, -	·45	·904	0	Trace	·16	Very small trace

[a] Brit. Med. Journ. January, 1885.

In the face of these facts no one can, I think, refuse to admit the influence exercised by atrophy or removal of the thyroid gland in the production of myxœdema.

Naturally the question arises as to what the nature of this influence is—whether is the thyroid atrophy a primary change or one secondary to pre-existing disease in the nervous system? Irrespective of its function in relation to the cerebral circulation, which is a somewhat obscure one, the thyroid gland appears to exercise a two-fold office in the animal economy. By its large vesicles it excretes from the blood a large quantity of mucin, or a substance akin to it, and it has further a hæmatogenous function, as shown by the large quantity of lymphoid elements found in it. The removal of the gland is attended by an increase in the amount of mucin in the tissues which naturally secrete it, by the assumption of a muciparous function by a gland which ordinarily produces no mucin,[a] and by alteration as to number in the corpuscular elements of the blood. It occurs to me that we may regard the thyroid gland as one of those rudimental organs which, by removing certain elements from the blood, fit this fluid for the nutrition of other parts, and in this way effect a balance in the processes of nutrition. Thus the thyroid gland in its function may be said to furnish another instance of what Sir James Paget designates complemental nutrition. We have examples of this function in the mammary glands of the male, the delicate hair which covers the surface of the body, the relation of the growth of the beard to the development of the generative function, &c. The experiments of Sir Philip Egerton are also illustrative instances. In bucks that are castrated whilst the antlers are growing, it is found that the growth of the antlers is checked, and that they remain as stunted or irregular nodules of bone projecting from the surface. If castration be performed when the antlers are full grown, they are shed as usual at the end of the season, but at the end of the succeeding season they are replaced by low conical stumps. These instances serve to illustrate how the growth of certain tissues, or

[a] In the monkey, after removal of the thyroid gland, the parotid secretes mucin.

the exercise of function by certain organs, modifies the nutrition of other structures with which they have apparently no connection. In this way the thyroid gland may minister to the nutrition of the skin and connective tissue by removing from the blood certain elements, amongst them mucin, which, in defect of this function, may, by being retained in the blood, lead to the perversion of structure.

It is difficult as yet to pronounce any decided opinion as to whether the condition of the thyroid gland is the primary change in myxœdema, or is secondary to some lesion in the nervous system. Dr. Haddon,[a] in an interesting paper on the subject (*Brain*, Vol. V., p. 188, 1882), holds the view that the primary condition in myxœdema is an irritative lesion of the sympathetic. This induces a condition of generalised angiospasm, which depends either on a lesion of the vaso-constrictor or vaso-dilator filaments, and this angiospasm produces atrophy of the thyroid gland and a form of lymphatic obstruction which leads to the solid œdema of the skin and subcutaneous tissue. Kŏcher, who accepts this view, considers that in removal of the thyroid gland the sympathetics are injured or irritated by the ligatures placed on the vessels. His opinion, however, is negatived by the experiments of Schiff, who showed that if he merely exposed without removing the thyroid gland, and divided the nerves going to it, no effects like myxœdema followed, although there was considerable irritation of the nerves produced. What apparently affords support to Dr. Haddon's view is that the conditions noted in association with vaso-motor paralysis are exactly the reverse of those associated with vaso-motor spasm. Thus in exophthalmic goître we have elevation of temperature, a sweating skin, great excitement of the circulation, and a mental condition in which there is much excitability. In myxœdema, on the other hand, there is reduction of temperature, a dry, harsh skin, and a mental condition allied to the torpor which we meet with in cold-blooded animals. However, as yet no changes have been found in the sympathetic system to corroborate

---

[a] Le Progrès Médical, 1880, kindly lent to me by Professor Purser, also contains some papers by Dr. Haddon dealing with the causation of myxœdema.

the view suggested by Dr. Haddon, and it is especially noteworthy that Professor Horsley found that, in his cases of artificially induced myxœdema, the sympathetic nerves showed no trace of structural alteration.

Dr. Ord was at first disposed to regard the nervous phenomena developed in cases of myxœdema as due to the effects of the altered connective tissue on the peripheral nerve endings; that the nerves were immersed in a padding of myxœdematous tissue, and that, as a result of the absence of its accustomed stimulus, the brain fails in nutrition, and hence the mental hebetude produced. Both Dr. Ord and others have, however, recently pointed out that in the course of myxœdema the changes in the connective tissue are not confined to that of the skin, that the blood-vessels and the principal organs of the body, including the brain and spinal cord, present signs of degeneration, so that there can be no doubt that the nervous disturbances present are due to changes in the central nervous system. At the same time it is not improbable that the view first held by Dr. Ord is substantially correct, though in a modified degree. Central nervous disease does not of itself produce the peculiar train of nerve symptoms present in myxœdema; the widespread alteration which affects the peripheral nerves and touch corpuscles, and which leads to a blunted sensibility and delayed power of conduction, cannot be without influence on the mental and nervous states found in what may, I think, be fairly named "Ord's disease." In support of the view may be mentioned the observation made by M. Blaise in the "Archives de Neurologie," Vol. III., that in a case of myxœdema noted by him, the mental disorder and swollen state of the integuments underwent amelioration simultaneously.

It is only necessary to add a brief word of comment on the view entertained by Dr. Mahomed as to the nature of myxœdema. This observer regarded the condition as a symptom of Bright's disease, because in a number of cases *post-mortem* examination showed structural changes in the kidneys. The solid nature of the œdema is accounted for by an attempt at organisation which the chronicity of the condition engenders. The rule is in myx-

œdema for albuminuria to manifest itself towards the termination of the case, because the kidneys suffer in the general trophic disturbance ; but the history of cases of myxœdema, the experimental evidence that has accumulated in reference to it, and its nervous and mental peculiarities, show it to be a disease quite distinct from Morbus Brightii.

Why it occurs with such preponderating frequency in women is not clear. Women seem specially predisposed to affections of the thyroid gland. Basedow's or Graves' disease occurs in them, as contrasted with cases amongst males, in the proportion of two to one. Probably the periodical changes which the thyroid gland . undergoes during menstruation may favour the development of disease in the organ.

It is interesting to note how far the labours of the physiologist and the physician go towards limiting or preventing operative procedures which, though brilliant in their immediate results, lead to conditions that imperil life. However commendable it may be to aid in the advancement of the progress of medicine or surgery, it is of undoubted advantage to recognise what should be looked upon as finality, and it is scarcely conceivable, in the present state of our knowledge regarding the relation of myxœdema to loss of function of the thyroid gland, that removal of this organ in its entirety should be undertaken.

A CASE OF SUPPOSED ADDISON'S DISEASE.

By J. P. DOYLE, L.K.Q.C.P. ;

Demonstrator of Anatomy, Carmichael College of Medicine.

A DARK-COMPLEXIONED lady, somewhere between twenty-two and twenty-five years of age, whom I had attended through an attack of typhoid fever some five or six years ago, and subsequently for a slight enlargement of a gland in the left submaxillary region, called on me on the 15th of March last, having a most unhealthy ulcerated condition surrounding the root of the nail and end of one of her fingers. From it and from her general appearance and condition I told her mother I believed her daughter to be suffering from some form of blood-poisoning. I prescribed a carbolic dressing and salicylate of soda internally. When I saw her three days afterwards I was surprised to find the finger nearly well.

This patient called on me a month afterwards, and told me that she was suffering from lassitude ever since, and that about a fortnight previously (that is, about April the 1st), while the catamenial period was on, she over-fatigued herself by a long walk, and that she felt pains between her shoulders over left ovary, and, after eating, in epigastrium ; she had no inclination or taste for food. I found her pulse 100, small ; temperature, 101° Fahr. ; tongue large, pale, flabby, and covered with viscid mucus ; bowels sluggish ; she has generally to use enemata of soap and water.

On April the 23rd I saw my patient in bed for the first time. Temperature, 103° ; pulse, 104 ; respirations, 24—very clear over greater portion of lungs, but over upper lobe of left lung there was some coarseness and slight increase of resistance behind on percussion ; had a slight cough and very little expectoration—what comes is principally from mouth and fauces ; the slightest pressure of the stethoscope under the right breast produced pain ; vomits very frequently after breakfast, but always when she eats an egg.

On April the 28th she complained of pain over the position of the spleen.   Bowels were well moved after a haustus ol. ricini.   The examination of the sputum and other secretions giving negative results, and being anxious to arrive at a definite decision as to the nature of her illness, I asked Professor Purser to see her with me on April the 29th.   During the night, we were informed, she had suffered from a severe attack of abdominal pain.   Her temperature was 98·2° Fahr., and pulse 96.   Professor Purser having failed to find any tubercle bacilli in the sputum, was inclined not to consider it a case of tuberculosis.

My next visit was at 8 p.m. on May 2nd, in order to see what her temperature was at night, and I found it up to 104°; pulse, 120.   She was excited and suffering from a feeling as if bowels wanted to move.   I gave an enema, and on examination per rectum I found it empty, but the uterus slightly enlarged, retroverted, and pressing backward on the intestines.   I have no doubt it was the displacement backwards of the uterus on the rectum that gave rise to the feeling for evacuating the bowels.

On seeing her eight days afterwards her temperature was still up, and pulse quick; heart's action flabby, and sounds sharp; cough had become so troublesome at night as to prevent her sleeping, and she perspired profusely.   The coarseness over upper lobe of left lung still continued, and the physical signs of pleuritis behind were better marked; catamenia had appeared.

In the sputum, for the first time (May 25th), I detected the strepto-coccus.

On May 25th she felt much better, and was taking plenty of milk, but could not use solid food; has pain on going to stool. Temperature, 98·2°; pulse, 100; right side of face appeared slightly swollen; urine clear—specific gravity, 1005; acid; no albumen. During most of the time she was under my care she was very cheerful, and indifferent about her condition; got up, and on fine days went out for a drive.

When I next saw this lady it was at the seaside (on the 9th of June), and I was very much surprised by the change in her appearance.   She looked emaciated, was very feeble, and her respirations

became very hurried on making the slightest exertion; her face about the temples and along the attachment of the roots of the hair was of a darkish brown colour, and her cheeks had a bronzed hue. This discoloration of her face was noticed by her friends to have come on gradually. On the knuckle of the middle finger of right hand was a collapsed brownish-looking bullæ, which had come on without the reception of any apparent injury; the skin of the backs of the hands was also becoming discoloured; urine clear— sp. gravity, 1005; no albumen—temp., 97°; pulse, 132, very small. She suffered great pain in left iliac region before bowels moved.

On June 21st the discoloration of her face was more marked, and her right cheek had a hectic blush. Temperature, 104°; pulse, 140; bowels and catamenia regular; abdomen soft and distended; pain on pressure over position of head of pancreas and left inguinal region; skin of front of legs of a very dark mottled brown colour, said to have been produced by sitting too near the fire.

On June 22nd my patient's friend brought Dr. Finny in to see the case with me. He said she had phthisis, and that he discovered signs of commencing cavities in the top of the upper lobe of left lung. At the same time he agreed with me that she had Addison's disease, but that the above were secondary to tuberculosis. Temperature, 100°; pulse, 140, very small.

On June 27th I saw this lady as a patient for the last time (nor have I seen her since), and found her progressing favourably under the treatment suggested by Dr. Finny, which was to have her face and body sponged with sanitas lotion, and to take the following mixture :—

    ℞. Bismuth, subnitrat. . . . ℨi.
       Acid, nitric, dilut. . . . ℨi.
       Acid, hydrocyanic, dilut. . . ♍xxiv.
       Mucilage tragacanth . . . ℨxii.
       Tr. digitalis . . . . ℨi.
       Aquæ, ad. . . . . ℥vi.

M.—A twelfth part three times a day twenty minutes after food.

Having obtained the approval of the friends of my patient, I handed the case over to Dr. Finny, and I am now happy to say

that, under his judicious management and treatment, the lady—so her friends have informed me—with the exception of a slight discoloration remaining along the roots of her hair at the temples, is quite recovered, and has recently entered the married state. Dr. Finny, if present, I am sure, will be able to fill up the hiatus I have left in the progress of the case while under his care. The principal interest I attach to the narration of this case is to try and discover the nature of the primary affection. Tuberculosis would appear very reasonable to account for the cough, vomiting, fever, and pigmentary symptoms ; but I cannot accept it as proved, considering the frequent microscopical examinations of the sputum, and even the special one made by Professor Purser, all of which gave negative results.

Had any softening existed in the upper lobe of the left lung, I fail to see why we did not obtain positive results if it depended on tuberculosis, as in cases which I treated under apparently similar conditions, the microscope, so far, has never failed to show the presence of the characteristic tubercle bacillus. In the majority of instances you would not expect such a marked improvement to have taken place as in this patient, had the primary affection been tuberculosis.

The use of the microscope as one of our most important aids to recognise disease, and especially when used by men of experience, can be exemplified by the following case, out of many :—In February, 1883, Professor Purser saw a married woman with me, and although no physical signs of disease could be detected in the lungs, still the microscope confirmed our suspicions, and in about six weeks' time after the tubercle bacilli were found in the sputum. The case terminated fatally.

On May the 20th I stated I detected a chain-like micrococcus in the sputum of the subject of this paper, which looked very similar in appearance to the strepto-coccus pyogenes. The strepto-coccus is said to be frequently found in the secretion from the fauces. Its presence in this case can be looked upon as pointing to the primary origin of the disease as pyæmic, remembering that this lady first consulted me on March the 15th for an ulcerated condition of one of her fingers. The strepto-coccus pyogenes is said

generally to be found at some distance from the point at which it enters the body. If so, why may not the finger in this case have been the original place of entry of the fungus? and why may it not also have been the true strepto-coccus pyogenes I detected in the sputum, although not verified by cultivation or inoculation?

Pyæmia, as we know, is accompanied sometimes with febrile symptoms, and it may also in this case have set up some local affection in or near the vicinity of the suprarenal capsules, and by so doing have given rise to the pigmentation.

This lady suffered, as I said, from severe pain in the left ovarian region, and had also some uterine trouble, which may have been a factor in the production of the pigmentation on her face and hands and front of legs. The latter seemed especially noticeable, as it occurred on the marks of former scorchings. Any discolorations I have noticed in connection with uterine affections were not so brown, and had not the bronze tinge that this lady's countenance presented.

Discolorations of the skin resembling that occurring in morbus Addisonii depend on many causes besides diseases of the suprarenal glands and sympathetic nerves, the latest being a bronzing produced in children by the administration of arsenic, and alluded to in last week's *Medical Press and Circular* by Dr. Foy.

The form of Addison's disease that is most rapid in its fatal termination is frequently not accompanied by any characteristic changes in the integuments. The constitutional symptoms in this case preceded the appearance of the pigmentation by nearly three months, and such is very general in Addison's disease. The course of morbus Addisonii is mostly slow, and some cases are recorded by Dr. Greenhow in his work which were under his observation from two to eight years. The progress of the disease is also subject to remissions and exacerbations. Whether my former patient's improvement depended on a remission only time can tell.

We should hope, as we become more acquainted with the histology and physiology of the suprarenal organs and their connection with the nervous system, to be better equipped for unravelling the phenomena exhibited in cases of supposed Addison's disease.

SELECT CLINICAL REPORTS.

By ARTHUR WYNNE FOOT, M.D. Univ. Dubl.;

Senior Physician to the Meath Hospital;
Professor of Medicine in the Royal College of Surgeons in Ireland, &c.

[Read in the Medical Section, December 17, 1886.]

THE following cases, picked out of my hospital note-books, show that as strange a mixture of odd cases may be observed there as is to be met with in general practice.

Among the cases of dilapidated stomachs, contracted livers, decayed lungs, broken-down nervous systems, and worn-out hearts, it is a variety to meet with something besides the results of poverty and overwork.

I. OBSTINATE VOMITING FROM "LAND-SICKNESS."

At 11 a.m. on 18th September, 1885, a man, aged twenty-seven, applied at the hospital for relief for continued vomiting, which was accompanied with cramps in the abdominal muscles. Though there was no report of any purging, he was admitted and attended to at once, more particularly as choleraic cases were not unexpected about this time of year. He was put at once to bed, warmth applied to his feet and stomach, a sinapism to the nape, he was given effervescing draughts and ice to swallow in small pieces, yet the vomiting continued all day and through the following night.

Next morning, 19th, instead of finding him well, as I had expected, he had by his bedside a large basin nearly full of greenish fluid, towards which he turned himself every two or three minutes to make further additions, which were contributed with loud-roaring retchings, exactly similar to what is heard on a steamer during a rough passage. Between the acts of vomiting he writhed with cramps in the abdominal muscles. The urine was scanty; he "had not power to make any." The muscles seemed wearied out from their almost continuous tension. His head was clear and

he spoke most intelligently, but conversation seemed to aggravate the sickness, and most of the interesting points in the history of the case were elicited afterwards. He was apyrexial; the circulation was not hurried; the tongue was discoloured with bile, but not particularly furred; though there had been no evacuation from the bowels for six days, there was no evidence of internal obstruction. A mixture of chloral hydrate ($\mathrecord$ i + aq. laur. cer. ℥ i + aq. chlorof. ℥ vi.; dose, ℥ss., tertiis horis) was given him, sinapisms were reapplied to nape and epigastrium, and morphia injected hypodermically, without checking the vomiting, which continued, with a respite of three hours—during which he had some sleep, of which he was much in want—till next day, 20th.

As he then (20th) complained of feeling very weak, he was ordered a mixture of equal parts of brandy and water, to be taken as often as he wished. He was put into a hot bath this day, and felt immediate relief—the stomach became quiet, he got hungry at once, slept well the following night, and next morning (21st) eat heartily of bread and milk, and was making water freely; the cramps and pains had gone, with the exception of some muscular soreness. After another hot bath (on the 21st) he was quite well, and left hospital the following day.

The cause of this attack of obstinate vomiting was sea-sickness, which persisted after his leaving the vessel, and it was not the first time it had happened to him.

He had come from Glasgow to Belfast in a screw steamer on 14th September, as a deck passenger. A sailor, taking pity on his sufferings, had let him have his bunk for a small consideration. The passage occupied seven and a half hours (not longer than usual). The sea, according to nautical estimation, was not particularly boisterous; the sailors said "there was a bit of a swell on after a breeze" (there had been an "American storm" on the 12th and 13th). His sea-sickness continued for two days in Belfast (where he stopped, hoping it would cease before he came on to Dublin), continued during the railway journey from Belfast to Dublin, and he vomited several times while driving across Dublin on an outside car. In Dublin, on the 17th, he had medical advice, and an enema was prescribed for him, after which he had a short respite from the vomiting. As it soon returned he applied next morning (18th) at the Meath Hospital, as before mentioned.

Twice already this year he had suffered severely from sea-sickness, continuing after he had reached *terra firma*. In January

he had come from Glasgow to Belfast, been sick the whole time, and for two days afterwards in Belfast; on his return to Glasgow he chose the shortest sea route, *via* Larne and Stranraer—channel and loch passage about two and a half hours. He was sick in the train between Stranraer and Glasgow, and continued so for five days in Glasgow before he recovered. He would not have tempted Neptune on the present occasion but for a wish to see his mother, who lived in Dublin, during his holidays, and that he thought the weather at this time of year would have been more propitious than in mid-winter. He was a traveller for a draper in Glasgow, and his excursions were limited to the vicinity of that city. He could never bear the motion of a boat of any kind, and had been made sick by a swing; had a "bad head for heights," yet he was not liable to sick headaches, nor of a bilious temperament; was easily sickened by alcohol, but not by tobacco. He was the only member of his family so very susceptible to sea-sickness. He had brown hair and a fair skin, but could not be said to have the "light complexion and light hair" of those who sicken first at sea.[a]

This patient was an example of that kind of constitution which is morbidly prone to feel the effect of the motion of a vessel. There are some, on the other hand, who are totally insusceptible to the concussions which in the majority produce *nausea marina*. The continuance of his vomiting for nearly nine days, even after his arrival on shore, shows how possible it would be for such a person, on a lengthened voyage, to die of sea-sickness.

II. CASE OF MISTAKEN IDENTITY ON THE PART OF FOUR PERSONS.

The following incident of the memorable " whisky fire " which occurred in Dublin on the night of 18th June, 1875, produced a strong impression on me, and the following is an account of the incident from notes I made of it at the time :—Michael Healey, aged twenty-three, a corn porter, was one of several men who were brought to the Meath Hospital early on the morning of Saturday, 19th June, 1875, " dead drunk " from whisky taken at the great fire of the bonded stores in Chamber-street on the previous evening.

He and three others, equally comatose from alcohol, lay on

[a] See Dubl. Med. Press. Vol. XXIV., p. 41.

mattresses on the floor of the theatre in very good light. Relatives came during the day to look for missing friends who were scattered about among various hospitals.

At 3 p.m., on the 19th, a woman of the name of Kinshela, whose son was missing, came to look for him in the Meath Hospital. She immediately recognised the man Healey as her son, asked to see his trousers, and swore to the clothes on him as those of her son. She sat beside him, lamenting over his condition and the evils of drink till 8 p.m. Meanwhile her husband had arrived; he, too, recognised his son, and observed to me with much parental feeling, "Wasn't it an unfortunate thing for a father to see his son in this condition," and "if he had stayed at home this wouldn't have happened." Healey was still comatose from alcohol, and could neither speak nor open his eyes, but was not blackened, burned, or disfigured in any way beyond a somewhat bloated, congested appearance about the face.

Two daughters of the Kinshelas also came, and they, too, had no hesitation in agreeing they had found their missing brother. The supposed father remained by Healey for two hours; the two girls stopped a little longer; Mrs. Kinshela, as before mentioned, left the hospital at 8 p.m. to go home for the night. She found her own son at home, but did not notify this fact to any one in the hospital till the following (Sunday) morning, when she told the gate-porter she had got her son.

On Saturday night, at 9 p.m., an hour after Mrs. Kinshela had left, the real mother came, immediately recognised her son, and when told that he had been claimed by several other people, she said, "If he has not marks of burns upon his back and the side of his neck he is not my son." On stripping him the promised marks were found of burns which, when a boy, he had received in a match manufactory. The real mother seemed to recognise him more immediately than the false one, and the resident pupil, Mr. Hill Malone, told me the man appeared in a dim way conscious of the voice of his mother; while in reference to the other woman, he had not observed the least effect on him from her voice. Healey was a married man, but his wife did not come to look after him, as she was in the Union Hospital, and had either not heard of the occurrence, or was unable to come.

All along Mrs. Kinshela seemed to have some misgivings about Healey being really her son. She went home in the afternoon to

get her husband to come and give his opinion on the subject. She went home at 8 p.m. and left the man, though he was not expected to live through the night, and, in fact, did die on Sunday morning. The real mother remained all night. The opinions of the two Kinshela girls were probably much influenced by those of their parents—*i.e.*, when the father and mother thought the man was their son, the daughters, if they had any doubts about the identity, may not have felt bold enough to differ from such unquestionable authorities. Mrs. Kinshela offered to swear to the man's clothes, but the dress of working men is often very much alike. Had he been able to open his eyes, or to speak, the difficulty of identification would have been much lessened, as, independent of their colour, their *expression* gives a difference to *features* otherwise similar; and everyone knows how specially characteristic the voice is, and that it will recall to mind an individual whose features have been totally forgotten.

The whisky, which ran along the side channels in the streets during the fire, was of unusual strength and a good deal of it new. About thirty persons were brought to the hospitals in a state of coma; two deaths occurred among those carried to the Meath, one in the Richmond, and one in the Mater Misericordiæ Hospital.

It is seldom that the question of identity is difficult to decide in reference to a living body, and, when so, it usually arises in case of one returning home after a long absence, or where the plea of mistaken identity is put forward by one charged with some offence against the law. More usually does this question concern the dead—*Of whom is this the body?* (as in the case of Dr. Livingstone), where a body is brought from abroad, and doubt exists whether the remains are those of the person they are stated to be. It is one of the questions specially submitted at every inquest to the jury for their consideration.

III. ACUTE ARTICULAR GOUT.

On 27th October, 1885, a man, aged sixty-four, of sanguine temperament, corpulent, full-blooded, of plethoric habit of body, was admitted to the Meath Hospital with all the objective symptoms

of acute gout in the great toe of the right foot and in the left wrist. He had, in addition, a gouty abscess on the dorsal surface of the last phalanx of the middle finger of the left hand, and several tophi (gout-stones) in the helix of the ear on either side. He was the "jolly landlord" of a well-known house of rest and entertainment on the Naas road, weighed nineteen stones, and said that for the last thirty or forty years he had been in the habit of drinking fifteen or sixteen pints of porter every day! A week before admission he had been struck with a sudden pain in the ball of the right great toe, and soon afterwards a similar pain seized him in the left wrist. He had never felt a twinge in these parts before, but, nine years ago, he had had his first attack—in the left great toe and the middle joints of the right hand. For the week before admission he had had no sleep at night on account of the severity of the pain, and had spent the nights "twisting about like a windmill," not being able to lie with comfort in any position. He was otherwise apparently in robust health, his "Bardolphian" countenance beamed with good nature in the daytime (the pain was then in abeyance), and he had a joke and a laugh for everyone, or a story of incidents which had occurred on the Naas road. The skin about the root of the right great toe was deeply red, with a tendency to lividity—tense, glazed, and shiny, hot to the touch; the adjacent parts were œdematous, and coursed over by several turgid veins. The left wrist was less reddened, but more swollen, than the great toe; the superficial veins were not so conspicuous here as in the foot, the pain and tenderness seemed equally marked in both places. The urine was scanty, high-coloured, very acid, and deposited urates copiously; the urates were deeply tinted with the fiery pigment of purpurine. The right foot and left wrist were at once wrapped in fine wadding, and covered hermetically with guttapercha paper. After his bowels had been freed by mist. sen. co., he was ordered a mixture—viz., Vin. colch, ʒij; Sulph. magnes., ʒj.; aq. cinnam., ʒviij.; dose, ʒss., t. d. Milk diet, and a glass and a half of whisky in the day. At the same time I opened the "gouty abscess" which was at the proximal side of the matrix of the nail of middle finger of left hand, giving exit to a lot of milky paste, consisting of pus mixed with urates. He said it gave him relief to have this done.

By the 3rd of November (a week after admission) the pain and swelling had abated both in hand and foot; but, at 2 a.m. of this day, he was seized suddenly with a pain, referred to his heart, and

said to be precisely of the same kind as that which had ushered in the attack in toe and wrist. A sinapism was applied to the chest, the colchicum mixture was stopped, and one of cardam. tinct. co. and spt. am. arom. substituted for it. There was nothing unusual to be observed about the sounds or rhythm of the heart, and it is likely that this sudden anginal paroxysm (which did not recur) was connected with chronic endo-arteritis of the coronary arteries.

6th November.—He was put on potas. bicarb., ʒiij., sod. iod.. ʒj., and inf. calumbæ, ʒ 8 ; dose, ʒss., t. d. While taking this both ankles were attacked; and, as he said the potash medicine was taking away his appetite, he was given 15 grains every third hour of salicylate of soda, which was soon reduced to half the quantity. The skin over the affected joints desquamated freely, being particularly itchy during the process. He left hospital on the 28th of November, 1885, just a month after admission, with some stiffness in his foot and wrist, but in such a condition that he could readily attend to his business.

In this case there was no history of hereditary gout; it seemed to have been acquired by the combination of insufficient exercise and over-use of malt liquor. The cases in which the disease is developed during or after middle-life mainly originate *de novo*. It generally appears earlier in those who have inherited it. When the anginal attack occurred at the gouty hour (2 a.m.) he was much alarmed, because he had heard of gout "flying" to the heart, &c. The expression "flying gout," which is a most extraordinary one, seems to have been first used by Mrs. Hunter (wife of John Hunter), in a letter to Jenner about her husband,[a] in which she says (Sept. 13, 1785):—"He has been tormented with a flying gout since last March."

IV. SUBJECTIVE OSMIDROSIS.

The following very strange case first came under my notice at the Meath Hospital on the 23rd of September, 1878. He was a compositor, aged twenty-four, unmarried, stout, florid in complexion, of active and excitable temperament. He showed the most acute anxiety to be admitted and carefully examined, assuring the pupils in the admission room that he was a peculiar case.

[a] Palmer's Life of John Hunter, p. 96.

When I saw him in bed the next morning, the following particulars were elicited from him :—He was desirous to be cured of " an offensive heat or vapour arising from his body or breath, of which people complain," saying that his vicinity makes them sneeze, yawn, or feel drowsy. He declares that this emanation makes them turn pale, that it makes his own conjunctivæ smart, and that his presence similarly affects others near him. I smelt his breath during the fullest expiration and after coughing, and it was almost inodorous ; he had not fœtid perspiration of the feet ; he thought the exhalation came most from the axillæ, but I could not perceive that they were more hircic than such regions usually are, certainly not peculiarly so. His skin was soft and greasy, there was a notable accumulation of fat over the abdomen, he used to indulge his appetite in eating very much, and also took " a fair share " of drink. He had been salivated for syphilis fifteen years ago ; he had never had any symptom of lead-poisoning. It is two years since he became convinced that he was the source of the emanation of a noxious effluvium. If anyone sneezes near him he at once attributes their doing so to his presence. He is civil and intelligent, yet has been kept from employment, he asserts, owing to men objecting to work in his vicinity, and has for this reason lost situations both in Dublin and London. He had consulted a doctor in King's College Hospital, who gave him pills of creasote and carbolic acid, and desired him to wear chloralum pads in his axillæ and on the top of his head, without benefit. His bowels are always constipated ; he has a tendency to flexor cramp in his hands and to closure of the lower jaw. His mind is very much distressed from thinking on the annoyance to which he believes he is subject, and his sleep is disturbed from uneasiness of mind. Though I stood over him in bed for nearly an hour I could perceive no more odour from him than would come from any other greasy-skinned man of gross habit. As a proof that his presence was felt in the room, he told me that a young lad in the ward had sneezed six times the day before ; and on the morning of the 25th, when one of the class sneezed, he interrupted me while speaking to draw my attention to that evidence of his complaint. He connects every sneeze with himself. He says people have sneezed at the opposite side of the road when he was passing by ; and when I asked him what proof he had that he was the cause of their doing so, he says he never observed such a thing to happen till he got this complaint. No suggestion that they might have been taking snuff or

catching cold will he entertain for a moment. Thinking he might
be affected with a subjective sensation of smell arising from
fæcal retention or a disordered stomach, his bowels were well
cleared with castor-oil, and he was put on a course of dilute nitro-
muriatic acid with infusion of gentian, and permanganate of potas-
sium pills, while he had sound sleep at night from chloral and
bromide of potassium. Still he remained quite positive that some
noxious odour emanated from him which affected the Schneiderian
membrane of anyone who came near him.

As about this time a curious case had occurred in Dublin of the
elimination of sulphuretted hydrogen in the urine, I had his urine
collected carefully, and Dr. Lapper was kind enough to make a
more accurate analysis of it than I could undertake :—

Urine of 1st and 2nd of October = (24 hours) :—Total quan-
tity = 61 fl. oz.; normal tint, usual amount of sediment of vesical
mucus and epithelium; no peculiar smell from it, heated or in
the cold; specific gravity, 1014; very acid; no albumen, sugar,
or bile; urea = 0·8 per cent.; phosph. acid $(P_2O_5) = 0·135$ per
cent.; chlorine = 0·324 per cent. Dr. Lapper could detect nothing
abnormal in the sample.

As I could make no impression on him, he was not long re-
tained in hospital. I considered him a kind of hypochondriac.
He was morbidly attentive to the character of his excretions,
used to defecate upon a piece of paper, the more conveniently
to study the qualities of his motions, and examined his pulse and
tongue daily.

I saw no more of him for five years. He turned up again in
the month of May, 1883, and came to know had I yet found out
a cure for his disease. I admitted him at once, and commenced
a fresh study of him.

The following notes of his own words, taken down by myself
at the time, might seem too ridiculous to print but that I have met
with an analogous case in a gentleman of position and education,
which will be detailed in connection with this :—

His complaint is that " when in the workshop (he is a compositor)
for a month his fellow-workmen feel ill, bad, affected with lassi-
tude." When he has affected them thus, he leaves " through
scruples of conscience." Can give me no other proof of these
results of his presence than his own conviction. He affects horses,
makes them yawn and shake their harness. Fowls yawn by
stretching out their wing and the hind leg of the same side " to

refresh themselves." He makes people yawn at the other side of a sheet of glass, as when looking in at a shop window. What annoys him most is that he cannot follow " his profession;" if he does not leave the job he is employed on, his fellow-workmen give it up. The sensation his presence excites is that of an oppressive heat; the temperature of a room he is in changes. He believes he has communicated this disease to others—to his wife among them; and that in one instance it was communicated even to a third person. Animals are affected by his presence; he has heard cats sneeze at him.[*] A dog, ten months old, " and which was no fool of a dog," ran away from him. A singing thrush " became dumb " when he came near it. Horses and men have been affected against the wind—i.e., when to windward of him.

As I was aware that the late Dr. Jonathan Osborne[a] had a high opinion of the internal use of chloroform in hypochondriac affections, I put him on 3ss. doses of spt. chlor. in decoction of Iceland moss three times a day. After a week of this treatment he had become very weak and faint, and perspired profusely. The chloroform was stopped, and he was put on mist. quininæ, and the next day he had quite recovered from what looked like chloroform syncope. There was no alteration of his dominant idea. He took delight in talking of his " disease," even though his serio-comic observations created roars of laughter in the class. For the sake of discipline I was unable to keep him in, as he became quite a show, and many strangers came to see the " *sneeze-compeller*," and to draw him out about his strange influence upon men and animals.

In January, 1884, he presented himself for the third time at the hospital, and, lest I should have forgotten his case, he handed me the following characteristic document, written in a neat hand, which I copy *verbatim* :—

" Gentlemen,—In order to save time and to be explicit, I have, in reference to my case, placed upon paper these few

Observations :—

" When I go to work—when I lay my attention to my business as a compositor—the room where I am employed becomes unpleasant—that is, 'stuffy,' warm, and oppressive. After three or four days all who have associated with me for that time become affected as follows—they sneeze, yawn, turn pale, complain of

---

[a] Dubl. Quart. Jour. Med. Sci. Vol. XVI., p. 463.

headache, and feel generally disinclined to continue work. This I have proved in fifty different places, and have left them all through conscientious scruples, but never explained. I disturb everyone *by my presence* (much to my annoyance), and always feel better when I am alone; disturb people who may be near me from falling asleep, and when they ultimately do fall asleep they awake in the morning complaining of being tired and unrefreshed. Inferior animals (the horse and dog, for instance) become uneasy if I am near them for any time. Persons going smartly about their business in the street (30 say out of every 100) yawn as I pass by; others sneeze when I am near them in the street. Women cross themselves when I suddenly meet them turning a corner (without colliding). Young children run away when they see me approach. Wherever I go I am 'suspected' after a short time. If I go into a tavern, for instance, all present turn round and look at me after standing by a few minutes, and severe remarks are sure to follow—such as, 'I thought Marwood was dead.' 'So did I.' 'So did I too.' 'Maybe 'tis Binns!' . . . When in company with the sex, they become disgusted *with my presence*, no matter how gracious I try to be. 'What kind of man is this?' is the current remark with the ladies. *Persons who know me can tell whether I am in the house or not, even if they do not see or hear me come in!!* Cannot fix my attention on anything for more than five minutes. Cannot stay in the one place. Must always be moving. Perpetual miserable feeling of *ennui*. After a short time *persons get nervous in my company.* I myself have a good nerve—could stand and see a man cut up by a locomotive without being moved in the least. Nothing has a charm for me—not even money. My whole anxiety is owing to loss of independence, caused by not being able to follow my profession in consequence of this infernal infirmity. Have had to live on my relatives for years. Indecision. Depression. *Food seemingly does not nourish the body*, although I live pretty well, and have a good appetite. Thin blood, cold surface. Decay of muscle. Consider that the economy of the nervous system—or indeed the economy of nature's realm—has been disturbed through some cause—indiscretion, concupiscence, venereal disease, or what not. Pain in back of head lately. Never sought advice in Dublin outside of this hospital. Was ever mortal so afflicted? Four years is a long time to live on such terms as these and to be in one's right mind. Dr. —— is the only physician who has given me a fair and patient hearing, and I believe his wish is that he could

cure me. Dr. —— also put a name on my disease, which gives me a hope that he can yet do something for me.

> " Obediently,
>
> " HARPUR."

A case, similar to the preceding, which, though not an hospital case I had many opportunities of studying, came under my notice several years previously, and appears from its singularity worthy of being related in connection with the above. It was that of a gentleman who laboured under the impression that he diffused around him an unpleasant effluvium, any indication of which I never could perceive, nor did I ever find any positive evidence that any one else had ever done so. He was aged thirty, very stout; weight, 15 st. 10 lbs.; fair-haired, fresh-looking; said he felt in perfect health, and indeed looked the picture of it. He came to me complaining " that he seemed to use up all the fresh air " in a room, railway carriage, or any confined compartment; that there was an overpowering smell diffused from his person which made people faint, open the windows in a railway carriage, or avoid his company. He asked me could he " be getting a skin like a black's," and also for " a large dose of castor-oil to sweep it all out of him." It did not proceed from decayed teeth, diseased nose or tonsils, nor was it from his feet. As he drank and smoked a good deal, eat his meals hastily and at irregular hours, and had some feeling of weight in his stomach after eating, I hazarded the conjecture that it might come from his stomach, although I could perceive no unusual odour from his skin or breath, while closeted with him in a small room for some time. I did not venture on a first acquaintance to question the many proofs he offered in evidence of the reality of his complaint. He was ordered pills of creasote, a mouth-wash of glycerine of carbolic acid, a mixture of hyposulphite of soda, sulphurous acid, and infusion of quassia, and advised to keep in the open air as much as possible He had of late been much hurried and worried by business; an election petition had been lodged and carried against his brother, to whom he was agent, and this had thrown much extra work and trouble on him.

I saw him first 6th March, 1872. On the 12th he said he was satisfied the odour did not come from his stomach, and therefore had not used all the medicines ordered. He explains that it is not so much a bad smell from him that he suffers from, but that he

seems to absorb all the fresh air in a room, making it close, heavy, and oppressive. He even dislikes going into the smoking-room of his club, because he feels he is disagreeable to others. He thinks " the smell from his skin is much worse after Turkish baths than before them." I increased the dose of creasote in his pills, and ordered sulpho-carbolate of sodium with cascarilla.

8th June.—He does not find the medicines have had any effect, and asks for something else, reminding me that " while enjoying perfect health in every other respect, his presence had the effect lately of making a room so close and disagreeable as to bring water to the eyes of every person present." I then gave him chlorate of potassium, dilute muriatic acid, and infusion of quassia.

22nd.—" The last medicine had not the slightest effect." He was afraid it would require something which would make a constitutional change to effect a cure. He would prefer any remedy, no matter how tedious, disagreeable, or dangerous, rather than remain as he was, as, " while quite well in other respects, his presence at once brings tears to the eyes of anyone near, and makes a room as suffocating as if fifty persons had slept there." Was put on iodide of potassium, in 3-grain doses, ter die.

23rd July.—The last prescription " no use." Has given up smoking and become most particular about eating and drinking, takes both horse and walking exercise every day, Turkish baths frequently, sponge bath daily. He does not find anything wrong with his stomach, and thinks his complaint must arise from " gouty tendencies," although they have never otherwise manifested themselves. He suggests that " some very strong and powerful medicine for purifying the blood and removing the humorous matters might be what is required." Was given 4 min. doses liq. arsenicalis, with 5 min. doses tinct. sem. colch. in liq. ext. sarsæ, ter die, and told to drink lithia water freely.

11th August.—Had not experienced the slightest relief from these remedies. He had " gone on Banting," and been already reduced a stone in weight. Begged of me to mention his case to some of the celebrated physicians, and ask them had they met a case like it, and what was the cure for it. " I know the treatment must be perplexing, as I have no apparent symptom of disease to show what organ is affected, my health and sleep being otherwise perfect, and I take scrupulous care as regards my eating and drinking, and about taking exercise. I have given over smoking, and I would sooner suffer from the most dangerous disease than

my present complaint." I now ordered 20 min. doses acid. sulph. arom. in water, twice a day. He had more than once spoken of the eyes of those near him smarting and becoming watery from his presence, and it occurred to me that some ammoniacal compound might be given off from the skin. It is stated that all sweat of a putrid odour contains free ammonia.[a] He was directed to sponge the axillæ after his baths with a lotion of chloride of zinc and rose water, use carbolic soaps, and continue on the Banting system, till he lost 2 st. more.

8th September.—Last prescriptions have had no more effect than the previous ones. His weight is now reduced from 15 st. 10 lbs. to 14 st. 2 lbs., and still lessening rapidly. He would say that "the most remarkable symptom is that any person in my presence, even in the open air, gets at once red in the face as well as having tears brought into his eyes." Of late he has taken no wine or alcohol in any form, and even larger doses of his medicine than had been ordered. Desired to continue the Banting till reduced to 13 st., and suggested to try a wineglassful of Murray's Fluid Magnesia three times a day.

10th.—In reply to my inquiry whether he could perceive any odour himself, he said :—" I perceive the exhalation most plainly in a room in which I have been for some time on my return to it. I think I gave all the medicines a fair trial, as I took two or three times the doses ordered of each for about a fortnight. Banting and grouse shooting are reducing my superfluous fat. I shall continue the Banting till I reduce myself to 12 stones." He had at this time tried creasote, charcoal, hyposulphites, sulphurous acid, sulphocarbolates, chlorate of potassium, tonics, iodide of potassium, Turkish and cold baths, arsenic, colchicum, lithia; given up smoking and alcohol; exercise, fluid magnesia, aromatic sulphuric acid, carbolic soap, lotion of chloride of zinc, Banting.

16th December.—In nowise improved. Now advised him to give up butter and fat-forming foods, and to take plenty of exercise in open air. The butter was to be abandoned because it promotes the formation of volatile fatty acids, eliminated by the sebaceous glands, as demonstrated by Magendie's experiments of feeding dogs on butter.[b]

I suppose he gave me up in despair, as I saw no more of him

[a] Dis. of Skin. Erasmus Wilson. P. 583. Fourth Edition.
[b] See Russell Reynolds' Syst. Med. Vol. III., p. 362.

till 26th February, 1875, when he said he was quite rid of his complaint. He was then just as fat and florid as usual.

I have met with a third instance of this affection or disease. It was in a man who was sent up to the Meath Hospital, six or seven years ago, from the County of Carlow. I have lost, or cannot find, the notes I took at the time, but have a perfect recollection of the main features of his case. He was driver of a posting-car connected with Ward's Hotel, Bagnalstown, and complained that the smell he gave off annoyed passengers, even on the other side of the car, in the open air, and that to such a degree that he said unless he could be cured he should have to turn to some other occupation. He was of middle age, robust, in perfect health, not red-haired, neither more nor less odoriferous (as far as I or any of the students could perceive) than other hospital patients. He thought he was more disagreeable in summer than in winter, but accounted for this by his wearing a heavier overcoat in winter time, which interfered with the dissipation of the vapour which he believed came from him.

I have called these cases by the name of osmidrosis ($\overset{\text{?}}{o}\sigma\mu\acute{\eta}$, odor ; $\overset{\text{?}}{\iota}\delta\rho\acute{\omega}s$, sudor), because the perspiration, even in persons of the Caucasian race, has, on account of volatile organic acids, often a peculiar odour. It is, moreover, in use in the text-books.[a] I have used the word " subjective " because I am inclined to think that each of the individuals was labouring under a hallucination. In the case of the two hospital patients none of the class or of the nurses could ever perceive any smell at all approaching in degree what they said they were the originators of. In the case of the gentleman, though he said he made small rooms unbearable, I several times asked people with very sensitive noses was there any peculiar smell in a moderate-sized room where he had been for fifteen or twenty minutes, and they never could perceive any immediately after he had left it, nor did I ever find it necessary to open windows or use deodorants after a visit from him. Hallucinations of smell occur more rarely than of sight or hearing ; yet hysterical patients, in particular, often smell objects which are not

---

[a] *Ex. gr.*, E. Wilson, Diseases of Skin : Quain's Dict. of Med. (Art. Perspiration) ; von Ziemssen, Handbook of Skin Disease.

present—such as sulphur, musk, violets, &c. Feuchtersleben[a] was acquainted with a lady who was often tormented by a charnel smell that seemed to follow her everywhere, for which there was no organic cause. Cases are common enough of bromidrosis pedum (fetid perspiration of the feet), which arises from decomposition of the products of the *sebaceous* glands, but there are very few detailed cases of the functional disturbances of the *sweat* glands. Prof. Geber[b] mentions his having had under treatment a patient who otherwise did not show the least trace of bromidrosis, but whenever he began to perspire more freely, as after eating and drinking heartily, or by active exercise, so offensive an exhalation spread around him that he was forced to shun all social intercourse. Baths, cold ablutions, and hydro-therapeutics, continued for weeks, produced no improvement.

Anomalies of the special senses occasionally occur in a state of apparent health. These conditions are, as Griesinger remarks, in general far too little studied, being usually thrown into the comprehensive class of hypochondriasis. Sometimes organic change is found in connection with these sensory disturbances. In a patient who had strong hallucinations of smell a fungus of the dura mater, as large as a hazel nut, was found in the cribriform process, and surrounded by the olfactory nerves.[c] In another patient, who had been constantly followed for more than six months by a smell of dead bodies, there was found an abscess of the corpus callosum.[d] Suicide even has been resorted to so as to escape from the persistent annoyance of a smell. On 17th April, 1882, a man applied at University College Hospital complaining that so terrible a stench came from ulceration of the stump of his leg (the limb had been amputated by Mr. Marshall five or six years earlier) that no one could bear to come near him. On examination this was found to be a manifest delusion. On the following day, however, he was admitted, having made a most determined attempt to commit suicide

[a] Medical Psychology. Syd. Soc. P. 233.
[b] Handbook of Skin Disease. Von Ziemssen. P. 506.
[c] Vienna Asylum Report, 1858. P. 266.
[d] Griesinger on Mental Diseases. Syd. Soc. P. 101.

by throwing himself upon the point of a sword-cane, which trans-
fixed the stomach and left lung.   He died in five days.[a]

The opinion may, I think, be fairly entertained that in these
cases, which I have called subjective osmidrosis, there was some
disorder of the elementary sensory apparatus appropriated to the
function of smell, causing the sensory cortical centre to enter into
spontaneous activity in the absence of any external impression,
producing thereby a hallucination—that is, a sensation in the
absence of any external cause, or of any irritation of the peripheral
end organs or of the sensory conducting paths.

[a] Brit. Med. Jour., 29th April, 1882.   P. 629.

VARIATIONS IN FORM OF MENTAL AFFECTIONS IN RELATION TO THE CLASSIFICATION OF INSANITY.

By CONOLLY NORMAN, M.K.Q.C.P., F.R.C.S.;

Medical Superintendent of the Richmond District Asylum, Dublin.

THE question of the classification of insanity is one that has given rise to an extreme diversity of opinion among alienists. In ordinary medical treatises, and among medical men who are not specialists, the time-honoured classification of Pinel, modified by the inclusion of Monomania (Esquirol) and General Paralysis, may be said to hold the field. Meanwhile, nearly every special writer has adopted a classificatory scheme of his own. The insufficiency of the ordinary arrangement is universally acknowledged, but grave objections are made to every one of the proposed substitutes, and no approach to concord on this subject among our greatest authorities has been arrived at.

Most of the older classifications are essentially metaphysical, and are founded upon fanciful distinctions and subdivisions of the mental faculties, which may be of some value from the metaphysician's point of view, but are entirely without clinical equivalent. On the other hand, some modern schemes have gone too far in the opposite direction, and their authors seem to forget that they are dealing with an organ that has functions of its own, the aberrations of which cannot be described in terms pertinent to the functions of any other part.

Two remarkable classifications have been produced in England in recent times. One of these—the somato-ætiological of Dr. Skae—was once extensively used, but has, I think, been generally relinquished of late. It has two chief faults—first, it gives undue

prominence to all those causes of insanity which act indirectly, and throws into the shade those which act directly upon the brain itself; secondly, out of about two dozen divisions, one, which cannot properly be called a class at all—namely, idiopathic insanity—will include, in all probability, half the cases that come under our notice. The "ideal classification" which Dr. Savage suggests, but does not use—a classification founded upon the developmental periods at which insanity appears—presents this fatal objection, that the "insanity of maturity" (including at least half our cases) is a mere arbitrary phrase without physiological or pathological significance.

The classification which I have found to correspond most closely to facts, as I have seen them, is that of v. Krafft-Ebing. It appears to me that the distinction which that author, in common with several of his countrymen, makes between psycho-neuroses and conditions of mental degeneration is a genuine one, and is of the greatest value from a prognostic point of view. The psycho-neuroses he again divides, exclusive of secondary states, into Melancholia, Mania, and Stupor (Acute Dementia); the psychical degenerations into Folie raisonnante, Moral Insanity, Primary Derangement, Insanity arising from the Transformation of Constitutional Neuroses, and Periodic Insanity.

While giving a general adhesion to this scheme, I do not at all shut my eyes to the enormous difficulties that surround the whole question of classification. Cases not infrequently occur which, even though they present well-marked symptoms, are extremely puzzling, and seem incapable of being drawn within classificatory bounds. I have brought forward the three following cases, noted by me several years ago, as I think they strikingly exemplify some of the problems which an entirely satisfactory classification would solve. I must say I have been unable to locate the cases in any scheme with which I am acquainted:—

CASE I.—A. B., male, aged on admission nineteen years, single, belonging to the better class of peasants; no hereditary history of insanity or other nervous affection. Patient is said to have enjoyed excellent health till the oncome of the illness about to be described.

On the fourth day previous to his admission he complained of headache and lassitude, which he attributed to overworking himself at his labour. The following night he awoke screaming, wept, laughed and flung his limbs about (hysterical attack). Next day he was restless, unable to settle to anything, and talked rather incoherently on general subjects. At night he was sleepless, laughing, singing, declaring his ability to do without sleep, and soforth. Henceforward restlessness and excitement continued and increased so much that restraint was adopted by patient's friends.

On admission.—Of middle height; thin; muscular and general development fair; supra-mammary portion of chest somewhat flat; light complexion; thin, transparent-looking skin, and pearly conjunctivæ. Physical examination revealed no abnormality in the thoracic viscera. Mentally, patient was excited, incoherent, restless, and hilarious; from mere lack of attention he could not reply to questions; laughed, shouted, sang snatches of songs, grimaced, and was perpetually moving about; no definite delusions, but he was apt to mistake, or seemed to mistake, those about him for his own relations; inclined to be destructive; appetite ravenous; quarrelsome and mischievous with the other patients.

The earlier progress of the case does not call for any special comment. Occasionally there was a tendency to grimace and attitudinise; now and again transient fits of weeping were mingled with the laughter that more usually associated itself with his constant flow of incoherent talk; but the general mental tone was neither theatrical nor pathetic, but simply maniacal. Violent bursts of passion occurred on slight provocation, but the attention was readily attracted to something else, and the outbreaks were of short duration. After the first fortnight the patient slept fairly, and was rarely noisy at night, save for short periods. Masturbation could not be proved, though nocturnal seminal emissions were undoubtedly unduly frequent.

When the patient had been three months under observation it was noted that the excitement had begun to abate. He answered more coherently and was less restless and noisy. About a week later he was sluggish and almost completely silent. His condition, which had at first resembled that state of dulness (probably due to exhaustion) which so often succeeds an attack of acute mania and is a herald of convalescence, now excited a suspicion of intercurrent pulmonary trouble. No physical disease, however, could be discovered; neither was there any further reason to believe that

masturbation was practised.   The condition rapidly developed into one presenting a perfect picture of acute dementia.   The patient never moved on his own initiative; he sat perfectly still in one posture for hours.   He was absolutely silent.   His food required to be put far into his mouth before he would swallow.   He was entirely inattentive to natural calls.   Cutaneous sensibility seemed much diminished, and the conjunctiva could be brusquely touched without exciting a wink.   The extremities were cold and blue, and slight swelling about the ankles was observed on one or two occasions at bedtime.   In the earlier period of the maniacal state the tongue had been, as is usual in such conditions, pretty thickly furred; the pupils of medium size and highly sensitive; the pulse quick and bounding.   Now the tongue was clean, large, and flabby; the saliva, of which there was apparently an over-secretion, was permitted to dribble constantly; the pupils were largely dilated and extremely sluggish; the pulse was small and slow when the patient was at rest, though easily accelerated by forced movements; facial expression fixed and vacant, altogether irresponsive.   The limbs did not remain fixed when placed in unnatural or uncomfortable postures.   The patient did not resist being moved, fed, or otherwise attended to.   Sleep was apparently good.

For almost three months no change was perceptible in the patient's condition.   Then he began to attend to natural calls, took food of his own accord, and appeared to notice what was going on around him.   By slow degrees he became active, and very gradually gained intelligence.   He was discharged, recovered, eleven months and two weeks after his admission.

According to his own statement, which I see no reason to disbelieve, his memory of the events of the first (maniacal) portion of his illness is merely summary and vague.   He had no recollection of being brought to the Asylum.   Some little time after his admission his memory became clearer, and he could relate incidents that occurred during the second month of his treatment.   Later on he again lost recollection.   He could not recall any memory of his second (demented) condition.   He could not remember its oncome, and his first recollection is a sense of dulness and a feeling of wondering what was the matter with him.   After this there were no further gaps in memory, so that this may be taken as representing the beginning of convalescence.   He had no remembrance of any painful feelings or ideas or any sense of oppression or suffering of any kind.

Case II.—C. D., female, aged twenty-two years; bad family history; father and mother, who were second cousins, were both habitual drunkards. The former had died after a drinking bout some years before patient came under observation; the latter became insane shortly after her daughter, and died in the asylum. There was also a strong tendency to pulmonary phthisis on both sides. Domestic trouble and reduced circumstances had visited the family. Patient had become a servant. About six weeks before her admission to the Asylum her master hanged himself, and it so happened that she was the first to find the suspended body. Ever since she had been depressed, liable to start up at night, declaring she saw a man hanging in the room, and soforth. Under the influence of increasing depression she had made an attempt to drown herself.

When admitted she was pale and thin, without physical signs of thoracic disease; intensely depressed; replying slowly and in whispers when spoken to; took little notice of anything that occurred around her. When pressed to account for her state she wept and said she only wished to die. Very sluggish; appetite miserable; forcible feeding occasionally necessary; insomnia, which was little affected by narcotics or enforced exercise. Later on it was noted that she gave expression to the delusion that her soul was lost and that the tortures of hell had already begun.

When the patient had been about nineteen months under observation she began to be somewhat noisy, weeping and bewailing herself loudly. In a short time she was evidently less depressed, though pathetic in her mode of expression, &c. In the course of about two months the character of her illness had completely changed. There was no longer a trace of depression; she was exceedingly restless, noisy, and incoherent; in manner she was hilarious and erotic; she presented no fixed delusions; she was dirty in habits, which she had not been before, and destructive. She continued in this state up to the period of her death, which occurred from pulmonary phthisis almost two years later. There was no development in the direction of secondary dementia or insanity of a delusional type. She remained to the last in a condition of simple mania—noisy, hilarious, incoherent, restless, and erotic.

Case III.—E. H., male, aged twenty-five, shopkeeper. An elder brother, it is stated, was an epileptic, but has ceased to suffer

from fits; a sister is epileptic; another sister died suddenly after a "drinking bout;" a brother is liable to uncontrollable attacks of drink-craving; one brother, who seems perfectly healthy in every way, is a man of remarkable and distinguished ability; a maternal first cousin is insane. Patient on first admission was stated by his friends to have previously enjoyed good health, and was said to have been generally sober, though it was admitted that he had been "on a spree" shortly before this illness came on.

On admission.—He was a well-nourished, strong-looking young man, somewhat pale. He presented a slight degree of alcoholic tremor, the pulse was quick and irritable, and the tongue thickly coated. He was very restless; talked incessantly and rather incoherently; said he "was in excellent health"—had been "drinking a little lately, but this was in consequence of a lady having jilted him;" he "must be discharged at once, as he was sure the lady would marry him now;" he "must return to his business;" was "quite fit for business," and had a "large number of important transactions awaiting completion on his return home," and soforth. He slept badly, and his appetite was capricious. He was very untidy in personal habits.

After admission a rapid improvement took place. He soon gained colour and appetite, and began to sleep well; the tremor disappeared; he became neat in his habits, much less talkative, and quite coherent. He ceased to be restless; he smiled at his former projects of matrimony, nevertheless there remained a certain frivolity of speech and manner. He warmly maintained that he had never been insane, never been a drunkard, or vicious in any way. "He had gotten a little excited, but never should have been deprived of his liberty." He was full of projects for improving his business, which, though not distinctly delusional, were visionary. He was perfectly self-confident and seemed in no way to realise his true position. While he was in this state, and some two months after his admission, he was removed from the Asylum by his friends contrary to my advice.

Within a few days of his discharge he went on a trip to relatives in America, "until the talk about his being in the Asylum should blow over." He returned home, however, almost immediately. His friends then noticed him dull and pre-occupied. One evening, about seven weeks after his discharge, he made a very deliberate attempt to hang himself, and was only saved by the breaking of the leather belt whereby he was suspended.

He was immediately placed under my care again. At this time he was suffering from extensive ecchymoses beneath the ocular conjunctivæ and beneath the skin of the eyelids, such as I have seen in one or two other cases of attempted suicide by hanging. He was intensely depressed; declared he was lost soul and body, could never get well, would never be the same as he was before, could not sleep or rest, and was full of misery. His account of his former life was singularly different from that which he had previously given. He said that he had practised masturbation from early boyhood. Desire for gratification by self-abuse was "very strong sometimes," and, as he says, overcame him. At other times for days or months he would regard such matters with disgust. For the last year he had been liable to seminal emissions at night and occasionally also by day when travelling on cars, &c. Since he was fifteen years of age he has been in the habit of drinking hard, keeping generally sober by day and drinking in excess at night. For many years he had been liable to strange feelings of dread. He was haunted by groundless apprehensions that he might fail in business. He was liable to be kept awake at night by an uneasiness lest the fire had not been raked out and the house might be burned. If he saw a slater on a roof he was tormented with an apprehension of what would happen if the man were to fall. He had vague, pensive, yearning feelings. He envied men whom he saw working and seeming to enjoy their labours, and thought—"If I were in that man's place perhaps I could be happy and unthinking like him," but his own lot always made him anxious. He was liable to a nameless, causeless dread, which he "could best describe as a feeling of loneliness." Such was now his description of his ordinary condition before he first became ill.

He remained under my care for about two and a half months, during which time he made several desperate suicidal attempts. On one occasion, having secreted a piece of a wire umbrella rib about six inches long, he fixed the windpipe with one hand, and with the other thrust the wire into his neck under the ear, and worked it along till he forced it into the trachea, which he stated (I believe truly) that he pierced in three separate places. No worse consequence than somewhat extensive subcutaneous emphysema of the neck and front of chest ensued. The reasons he assigned for this and other attempts of a like nature were that his mind was in a state of torture; that he never ceased by day or night thinking of the misery of being in an Asylum; and that he felt his reason

would soon give way under the strain of suffering and want of sleep. He slept badly, and, as is not unusual in such cases, denied that he slept at all.

Now, taking the first of these cases, we have the following phenomena :—An attack of acute mania passing rapidly into acute dementia, and ending in complete and apparently permanent recovery. Supposing the illness to have been (as it appears to have been) a simple psycho-neurosis, we find two extremely well-marked forms of insanity inextricably associated. On the other hand, an alternation or succession of diverse symptoms undoubtedly points to a psychical degeneration. This is best seen in the very unfavourable *folie circulaire* of Falret (*folie à double forme*, Baillarger, included by von Krafft-Ebing as a subsection of periodic insanity), and the last-named author mentions that in rare cases of this affection, particularly in young men about the age of adolescence, alternation occurs between maniacal and stuporous conditions. Here, however, there was no cycle of alternations—the case terminated favourably, and the symptoms of both states were intensely marked—a condition that does not occur in *folie à double forme.* Neither was the case one of those described by Kahlbaum under the name of hebephrenia ; the symptoms were too distinctly marked ; there was not the prominent self-consciousness and tendency to theatrical display that are associated with that form of aberration, nor was there the characteristic progressive imbecility. Absence of motor tension sufficiently distinguishes the case from the katatonia of the same author, and indeed it has little resemblance to either form except in the anomalous succession of symptoms.

The second case was one in which degeneration was to be expected ; nevertheless the symptoms were purely those of melancholia and mania. It may be said that had life been prolonged the case would have turned out to be one of *folie circulaire,* but the extreme degree of the depression and exaltation are against that view.

I am unfortunately ignorant of the termination of the third case, which deprives it of some value. It has clinical interest, as

showing to what a case of exaltation may sometimes lead. The symptoms were purely maniacal and melancholic, yet the family history and the personal history even more strongly point towards the probability of degenerative disease. In connection with the latter, however, it would be unwise to attach too much importance to the confessions and retrospects of a sufferer from acute melancholia. The absence of delusion in the second stage—the purity, as it were, of the melancholic symptoms, was remarkable. I had no certain means of finding out the patient's condition between the first and second periods of treatment, but I consider the disease to have been essentially one—that is, I do not think there was any intervening period of perfect mental health. The case differed from *folie circulaire* in the same particulars as the others already commented on.

None of the older classifications helps one to understand such cases at all better. On the contrary, if we adopt the ordinary divisions of mental diseases, we are met by the difficulty of finding three distinct forms running into each other. Krafft-Ebing is, no doubt, right in grouping together the three typical forms that are associated with predominating emotional disturbance, and cases like those described would lead one to think that the connection is even more close than his classification suggests. The relations of the emotional to the delusional forms of aberration have been pretty clearly worked out by the Germans; the relation of the various emotional forms to each other is still obscure.

ON AN OUTBREAK OF DIPHTHERIA.

By ALBERT MOUILLOT, M.B.;

Medical Officer of the Workhouse, Gorey.

AN outbreak of diphtheria which came under my observation last year seems to me to be worth bringing under the notice of the Academy of Medicine as a contribution to the natural history of that disease—particularly as all the cases that recovered have been under my observation ever since the outbreak occurred, and consequently none of the after-effects are likely to have passed unnoticed. On the 12th of December, 1885, there were twenty-four children attending the female and infant school attached to the Gorey Workhouse. All were in good health. On that day the first case was brought to me, and in a short time fourteen of these children, whose ages ranged from three to sixteen years, had diphtheria. In addition to these I had four other cases—one the mother of one of the children; another an infant, whose sister attended the school; a third, a child admitted to the school subsequent to the 12th December, who was seized in seven days after admission; and the fourth, a patient who was a convalescent from typhus, and took the disease in the fever hospital, to which place all the cases were transferred as they occurred.

It would take too long, and be too tedious, to give in detail my notes of these eighteen cases, so I shall content myself with giving an analysis of them; after which I will lay before you what I believe to have been the cause of the outbreak, and conclude with a few observations on the lessons taught me by it.

In three cases—aged five, six, and sixteen—the appearance of the throat was characteristic of diphtheria, and both local and constitutional symptoms were extremely severe. Of these cases, one, aged five, died on the tenth day, with laryngeal symptoms;

the others recovered without any ill effects. In four cases the false membrane was well developed, though the local symptoms were mild. One of this group, a child, who was attacked while convalescent from typhus, had her larynx involved on the fifth day. The dyspnœa was most distressing. I was anxious to perform tracheotomy, but the mother objected; however, after a severe struggle the child recovered. The three other cases got well; but one, aged four, suffered from ocular paralysis and partial paraplegia for six months. The cervical glands were enlarged in all cases in both these groups. In ten cases the appearance of the pharynx was that of follicular tonsillitis; there was no tendency to the formation of membrane; the tonsils were enlarged and the follicles covered with the usual yellow secretion; in eight of these cases the cervical glands were enlarged. The symptoms were mild, the only complaint being slight soreness of the throat. One of these cases subsequently suffered from paralysis of the palate, and nearly died of inanition in consequence. The remaining case was an infant, thirteen months old, who was not brought to me until the larynx was involved, and she died in a few hours.

To sum up briefly—out of eighteen cases two died, two had paralysis, and the remaining fourteen recovered without any after ill effects.

I should mention, however, that, even in the mildest cases, recovery to complete health was very slow. The nurse, who has had twenty years' experience in the fever hospital, remarked one day that she did not understand how it was that though many of the children did not seem "very bad," yet they did not "come round" like those recovering from fever.

The routine treatment I adopted was the tincture of perchloride of iron and a weak gargle of permanganate of potassium. Stimulants were freely given in a few severe cases, and steaming was used in the three cases in which the larynx was involved, with emetics, when required to relieve the dyspnœa. From the time of the commencement of the outbreak I ordered all the children in the school extra diet, and inspected their throats every morning, so as to isolate them as soon as possible.

In order to come to a correct conclusion as to the cause of this unfortunate outbreak, it will be necessary to remind you that the school children have very little opportunity of mixing with the outer world, or even with inmates of other classes in the house. I may also add that neither my friend Dr. Weldon nor myself was aware of any cases in the district at the time. The cause must then be looked for within the workhouse walls, and as only children in the female school were affected it is more likely to be found in some insanitary condition affecting them alone than in polluted milk or water, which would probably also have affected the boys' school and infirmary, all being supplied from the same sources.

In a plan of the drains which I prepared it can be seen that immediately behind the girls' school-room and dormitory is a small yard. This yard had long been disused and never opened. It had been quite forgotten that the drain from the wash-house ran through it instead of taking the more direct course to the outlet. The consequence was that the drain had become choked at a place marked X on the plan, and a most sickening odour was emitted from the catchment trap situated immediately under both school-room and dormitory windows. The conclusions I have drawn from the outbreak are as follows:—

In the first place, it shows, almost beyond doubt, that true diphtheria *can* be caused by foul drains, and can commence *de novo* in consequence of them, for the drainage of the workhouse is quite separate from that of any other building, and I find no record of any cases having been in the house for twenty years. As diphtheria is a specific disease, some authorities doubt the possibility of this; and if it is possible in the case of diphtheria, why not in typhoid fever? though it is extremely difficult to understand why a bad drain odour should produce one disease in one case and another in another. Some light might be thrown on this subject by considering the nature of the material which the drains are employed to carry away. In this case the drain is mainly used to convey the washing from the laundry, consisting of soap-suds and water. There are no closets in connection with it, but I have no doubt that urine is occasionally thrown into it, and possibly some

of the broth used in the house, which contains meat and vege-
tables. The second important conclusion is that diphtheria *can* be
so like ordinary tonsillitis that, without the history of the case as
to opportunities of contagion, it would be impossible to distin-
guish between them. If one of the ten mild cases mentioned
had come first under my notice I would have admitted her to
the infirmary without hesitation, in which case the disease might
have spread much further.

It can hardly be doubted that these mild cases were really
diphtheria, as they were produced by the same cause, followed by
paralysis in one case, and in all cases by prolonged debility; and,
lastly, because none of the children so affected afterwards got
more marked diphtheritic symptoms, though placed in the same
ward with certainly diptheritic cases. This point is of great
importance to us in practice. My experience will make me very
cautious in declaring any inflammatory sore throat as unimportant
and non-contagious if it can be traced to defective drainage. It is
remarkable, too, that the cases should vary so much in severity
when one considers how much alike the children were in their
surroundings.

I have now finished my brief record, and must apologise for the
want of any observations on the presence or absence of albu-
minuria. I found it impossible to have each child's urine kept
separate, owing to being short-handed in the nursing department.

PURPURA.

By ALBERT MOUILLOT, M.B.;

Medical Officer of the Workhouse, Gorey.

PURPURA is a sufficiently rare disease to make it a somewhat strange coincidence that two cases should occur in the private practice of a country doctor within a year, and the fact that both cases proved fatal shows, I think, that the standard text-books encourage one to give a much too favourable prognosis. In this opinion I am supported by the fact that, on inquiring from neighbouring doctors, I can hear of only two other cases, both of which died. My first case was a grocer and cattle-dealer, residing in Gorey, who called me to see him on Jan. 26th, 1885. He was forty years old, married. He said he drank a good deal of porter, but did not get drunk, and in driving cattle from fair to fair was at times subject to severe wettings and great fatigue. Ou Saturday, Jan. 20th, he got both wet and tired. He felt ill and weak on Jan. 21st and 22nd. On the 23rd his joints began to pain; the pains continued until he sent for me on 26th. I found H. P. a man of sallow complexion, with a face denoting great depression and debility; the temperature was normal; pulse 50, and very feeble; the urine was non-albuminous. I diagnosed the case as rheumatism caused by exposure, and ordered quinine.

For three days there was no marked change in the symptoms, but on my visit on the 29th I found the thighs and buttocks covered with large purple spots and small petechia, and in consequence changed my diagnosis to purpura rheumatica, and my treatment to perchloride of iron and ergot. Next day the purpuric spots were out on the face. He had a large ecchymosis in the right orbit, and blood appeared under the conjunctiva of the right eye. The joint-pains had subsided, but instead he complained of severe pain in the abdomen, which was much distended by flatus.

I ordered turpentine by mouth and rectum. From that time he began to sink ; loud rāles could be heard over the chest, caused by œdema from failing heart, or possibly at first by some hæmorrhage into the lung tissue. With the assistance of champagne and brandy he was kept alive until Feb. 2nd, on which day he died in a comatose state. Large quantities of clotted blood passed from the bowels on the day he died.

The serious nature of this case was indicated from the first by the great vascular depression. And I felt sure there was something more the matter than sub-acute rheumatism, but what that something was I could not tell until the spots appeared. No satisfactory family history could be obtained. The man always eat freely of cabbage and potatoes.

The second case was a gentleman of high social position, whom I knew very well, though he only once had occasion to consult me, and then only for muscular rheumatism. That was on Jan. 1st, 1885. I examined him thoroughly then, and considered him a healthy man. He was fifty-six years old. He went abroad in the following March, so, consequently, I saw nothing of him until his return on July 16th, when he sent for me. On entering his room I was horrified at the alteration in his appearance. He had a dull leaden look, and his face was covered by purple blotches. Like my other patient he had a " black eye." He gave me the following history of his illness :—About a month ago, while he was in Pau, he found himself depressed. He noticed that when cleaning his teeth his gums bled freely, and that the bleeding continued for some time after.

He consulted a doctor, who ordered him to Luchon, at which place he got worse ; the bleeding from the gums annoyed him all day and night ; he could get no rest. About this time the spots and blotches came, but he did not take much notice of them, as he thought them bites of insects inflicted at the hotel. At length he resolved to get home, and got to London on July 14th ; he there consulted a well-known physician, who ordered him to eat plenty of vegetables and to take the juice of about a dozen lemons a day. He appears to have given a very cheerful prognosis. My patient

described the journey from London as miserable. The blood-spitting went on incessantly. He did not know of any bleeders in his family. He had lived well, but was temperate in eating and drinking.

On examination of the mouth I found that nothing remained of the back teeth but old stumps overgrown by gums. The gums were oozing blood all over, and during my visit the patient was spitting blood every moment. The temperature was 99·5°; pulse, 99. There were about 20 blotches over face, arms, legs, besides innu-merable petechia. Some of the former were broken down, the raw surface oozing blood. I got him to make water and found it contained quantities of blood. I advised the patient to go to bed and stay there, but he told me that, bad as he was sitting up, he was ten times worse in bed. This I found to be the case. He did not like taking the lemons, so I did not press them particularly, as I suspected that the treatment was founded on an error in diagnosis. Ergot and iron were tried without effect. Tinct. Hamamelis certainly seemed to check the hæmaturia—at all events the bleeding ceased after that drug had been administered a few days. Nothing seemed to be the least use locally for the gums. Ice, tannin, iron, pressure, styptic colloid—in fact, everything I could think of was tried with only momentary success. I remained with my patient two nights, and shall never forget his misery. It is not possible to estimate the quantity of blood lost daily, but it was astonishing.

Fearing some sudden hæmorrhage, I got down a student from Dublin—a Mr. Russell—to remain constantly with the patient. He came early in August, and did everything that could be thought of.

The patient remained in much the same way until August 19th— that is, about seven weeks from beginning of the illness—when I was sent for in the night hurriedly. On my arrival I found him dead. Mr. Russell told me that about 11 p.m. he complained of intense pain in the right side of the head; after some little time he fell back in bed unconscious, the breathing became stertorous, and he died in about an hour and a half. Mr. Russell felt sure that the immediate cause of death was cerebral hæmorrhage, and I quite agree in that opinion.

FIXED DELUSIONS IN MENTAL DISEASE.

By JOHN MOLONY, M.K.Q.C.P., L.R.C.S.;

Medical Superintendent of St. Patrick's Hospital, Dublin.

[Read in the Medical Section, February 25, 1887.]

I WOULD remind the Academy of Medicine that the following are simply clinical notes of cases, which I have grouped as fair types of "fixed delusions" occurring in various forms of mental disease, and likely to be found in any lunatic asylum.

ACUTE DELUSIONAL INSANITY, WITH AUDITORY HALLUCINATIONS.

CASE.—H., aged forty-four years, served twenty-one years in the army, six of that period in India; left the service owing to ill health (form not ascertainable); insanity in mother's family; was admitted to St. Patrick's Hospital in 1885. For six months before admission he suffered from delusions of suspicion, viz.:—He was followed by "a gang," and in consequence it became necessary for him to go to "out of the way places" in Great Britain and Ireland, but after being a few days or weeks in a place he was "discovered." He complained repeatedly to the police and also to the proprietors of hotels he visited of this "watching system," and on account of being followed he was obliged to carry arms.

"The gang" consisted of three or four young men dressed like grooms. He never saw them, but he knew the kind of men they were. On one occasion he "thinks" he saw a member of the gang, and went to call a policeman, but before his return the fellow had disappeared. The gang managed in some way to get into their possession important private manuscripts and diaries belonging to the officers of his regiment.

After travelling about for several months he settled down to farming, but it was not long until his whereabouts were discovered, and then "the gang" increased in number, and commenced giving him "awful" annoyance by placing dynamite in his hay-cocks and corn-stacks, several of which he had to get knocked down to hunt

for the explosive, but "those fellows" were too sharp for him, and he never made a seizure. This state of things continued for some time, when suddenly one evening, while reading his newspaper, the gang commenced "tubing" at him—that is, listening to him and to his thoughts through long tubes connected with the bell-wires. Occasionally "they booed" at him for the purpose of exciting and making him speak, that they might become acquainted with his voice. This, however, he soon checked by getting electric bells through the house, which for a time "puzzled" the gang. There were also several attempts made to poison him through his food. For some weeks before admission there was a considerable amount of noisy excitement with occasional outbreaks of violence, during one of which he nearly shot a friend.

On admission.—H. is a muscular, powerful man of the middle height; his pupils are equal and respond to light; no tremor of tongue or of his limbs; pulse 80; temperature normal; he has a careworn, anxious expression of countenance; his hair, which is abundant, is tinged with gray; his tongue when protruded does not deviate to either side, and is clean and regular on surface; knee-jerk on both sides normal; his sight and hearing appear normal also; his clothes are tidily put on, but look uncared-for and unbrushed; he is not communicative, but answers questions sharply and to the point, and his articulation is not thickened. His pockets contained the following articles (which he afterwards informed me were for " circumventing " the gang):—Several pounds weight of keys, loaded gun and revolver cartridges in the same pocket with boxes of lucifer matches, two clinical thermometers, a couple of two-foot rules, pieces of copper wire, rubber tubing, dog whistles, a considerable sum of money in loose coin and notes, balls of twine, notebooks, letters to heads of detective departments in Dublin and London, and various other things.

For about three weeks after admission, beyond being mysterious and silent on the subject of his delusions, there was nothing remarkable in his condition. He acknowledged to having had syphilis when a young man; never suffered from sunstroke; was not a tippler or smoker, but occasionally has had a " B. and S." too much. He reads his newspapers, plays billiards, eats well and sleeps well, is tidy in his person and habits. One day he called me into his room, and informed me that he was " tracked at last through the means of a telephone, but he had discovered the name of the leader of the gang—' Bugger Bill,' and that *he* had passed a wire

over the house by means of a kite, and attached it to the gas and water pipes." From this time H. was always ready to speak on the subject of his delusions and hallucinations. He was constantly making "contact-breakers"—a piece of string or wire with a coal cinder attached, which he tied to the gas or water pipes. He placed pieces of rubber under the legs of his bed, and daily went his rounds examining the pipes with a roll of paper, which he used as a stethoscope. If he was satisfied with the result of his examination he exclaimed, with a knowing wink, "Now, Bugger Bill." There were certain parts of his room in which he heard the voices loudest. Once or twice the "voices hinted to him to do away with himself." For about twelve months he continued in this state, writing three or four letters daily to the Lord Lieutenant, Chief Secretary, and others. The following is an example :—

> "St. Patrick's Hospital,
>> "James's-street, ——, 1886.

"My dear Mrs. ——,—On Sunday last I put up a wire connecting the gas and water pipes of this house as a means of defussing the electricity which is sent in to this place by "Buggher-Bill" and thus to lesson the noise of the speaking and contact breakers the later of which produce effects for the time that the electricity is turned on strong of neuralgia dizziness and headache which will effect your boy and baby more than grown up people and as my stay here has been the means of B. B.'s coming here, I think it well to tell you of the above and of course I cannot say what will be their after effects. Now this after noon I find that the wire has been removed and you will now have them in their full force. Dr. Molony I am sorry to say has not met me half way in my wishes to lesson what the police are unable to cope with you should try and have this wire replaced and an-other put up nearer to Carter's gate. If you wish you can have this letter sent on to my solicitors Messrs. ——.

>> "I remain yours
>>> "H. ——."

H. increased in bodily weight, was not noisy at night, slept quietly, and his appetite was good. As a rule he was bright and cheery. Only on two occasions did he show a tendency to violence, on my refusal to allow him to remain in bed. He was perfectly clear on all the newspaper topics of the day. His memory for

recent and distant events was good. Except for his delusions, he was an agreeable and pleasant man to spend an hour with, and gave interesting accounts of different parts of the world which he had seen. I noticed for some months before his transfer to another asylum a considerable change in his expression. He wore a sullen, ill-tempered look, and was rather inclined to be blasphemous.

In preparing the notes of this case for the Medical Section, I confess that the name " Bugger Bill " grated unpleasantly on my ear, but when I considered the use of such an expression in the daily conversation of a refined and well-educated gentleman, as also in his voluminous letters to the Lord Lieutenant, female relatives, and others, the idiom, though no doubt unsavoury, appeared too valuable a feature amongst his other symptoms to be omitted.

CHRONIC (ACTIVE) MELANCHOLIA, WITH FIXED DELUSIONS OF PERSECUTION BY UNSEEN AGENCY.

CASE.—A. H., aged sixty-three; insanity in father's and mother's families; brother insane; exciting cause of her illness said to be " grief and pecuniary loss; " has been insane for several years. She is apparently a strong, healthy woman, with a melancholic expression of countenance. She walks " to and fro," wringing her hands, picking at her fingers and face, reiterating " I am not mad but bad," and bemoaning her wicked and sinful life; she considers herself too degraded to shake hands with anyone. There is no uterine or ovarian trouble observable, and there is nothing special in the state of the vulvæ, nor does she suffer from any vaginal discharge. She ceased to menstruate thirteen years ago.

A. H. states that for several years she has been brought out every night, dressed in fantastic garb, by a gang of sailors and soldiers, who ravish her, and then bring her for a similar purpose to the animals in the Zoological Gardens. She " constantly thinks " she sees on her food and on her room walls " shapes " of the heads of wild animals she has been with the night before. She is carried off on a car in a state of stupor from " drugs " or " drink " (paraffin oil and porter mixed). She is unable therefore to describe the men, car, or colour of the horse. The supposed outrage occurs between the hours of midnight and four o'clock a.m. I have frequently visited her at and between those hours, and have found

her sleeping, but on awaking she at once states, "I have only just been brought back." High walls, locks, or lofty windows, appear no obstacles to her imagination. I have never found on those occasions increased temperature or quickened pulse. This patient before admission made three attempts at suicide. She "jumped into a well six feet deep on her head, but could not sink or keep down; she tried to sink in a deep lake, but would not drown; she endeavoured to cut her throat, but the knife was not a sharp one." These speculations were much too half-hearted to be the "genuine article," but were highly characteristic. Her memory for recent and distant events (exclusive of matters connected with her delusions) is good. She sleeps well after midnight, has a good appetite, her bowels act regularly, nothing special in the state of her urine, and her habits are cleanly.

CHRONIC DEMENTIA, WITH FIXED DELUSIONS.

There is a peculiar delusion prominent, amongst others, in the case of one of our oldest inhabitants, who has been in St. Patrick's Hospital for 49 years.

CASE.—M. R., when asked the reason for her being an inmate, states that she "is an affirmation waiting to be called by the Crown to give evidence concerning the murder of the Son of God, which took place in Watling-street." When further questioned, she says, "He was my brother." It appears that her father, in days gone by, held an appointment in Green-street Court, where prisoners are tried by the Crown. This woman's bodily health is good; her habits are cleanly; she is occasionally noisy at night.

CHRONIC DELUSIONAL INSANITY.

CASE I.—G. (otherwise Marchioness of Picardy), 35 years insane, "suffers much from magnetism and nitrate of silver." Her sole object in life appears to be in stealing dinner-plates, for the purpose of placing them under her when in bed. The usual number "annexed" is three, which are found under her head, back, and legs, to "keep vile creatures from nitrate of silvering and magnetising her."

CASE II.—D., 40 years insane, states that "four most powerful policemen, who stand at the four points of the compass outside the building, think cruel and severe thoughts *at* him, which make

his throat sore;" "besides, they also think indecent thoughts *at* him, which cause him to blush, and they press their minds so heavily *on* him that he fears ulcers will break out over his body." This patient is of an economising turn of mind. To prevent his boots being worn out, he changes them from one foot to the other on alternate days; for a similar reason he cuts the heels out of his socks. He has invented and made an "everlasting stocking." Is a self-taught bookbinder—very useful in connection with our library.

"ALVINE EVACUATION EATING."

Some lunatics will eat anything, from old boots or clothes to tenpenny nails. Amongst all forms of insanity, acute or chronic, "wet and dirty" habits may be found—the prolonged continuance of either is an unfavourable symptom. Two out of four cases under my observation, which I bring before the Section on this occasion, are painful instances of how low man may fall. Dirt-eating ("Pica") is not an uncommon disease amongst certain children and hysterical young women, but amongst the insane only am I aware of the filthy habit to which I have alluded.

CASE.—H. S., a chronic dement (a well-educated professional man), aged sixty-five years, eats fæcal matter, recent or decomposed, whenever he can get an opportunity. Apparently he has never been the worse for this disgusting practice, which for several years he has indulged in. A female chronic dement of the same age is also addicted to this painful propensity. She has had frequent attacks of colic and vomiting after her unsavoury banquets.

I have met with several instances of this habit amongst the chronic insane. Spitzka speaks of it occurring in acute insanity, and Mickle in the early stages of general paralysis of the insane.

The only point of interest in connection with these cases is the position they hold in regard to the pythogenic origin of enteric fever. If I may be allowed, I would make a very limited digression with reference to what may be called "abortive" enteric fever (arising from an apparently *less* exciting cause, and from independent and isolated centres), many cases of which I have seen amongst young agricultural labourers in the country at "seed

time." These men (and indeed women too) work largely with their hands in teasing out and spreading manure on the potato crop. They also carry heavy basket-loads of it on their backs, so that their clothes become saturated with the manure. The days are showery, often mild and warm, during " seed time," the nights cold and damp, and the clothes worn through the day are too often utilised as extra bed-covering at night—the labourer living day and night for weeks in an atmosphere poisoned by decomposing manure exhalations. In a few days he suffers from rigors, head-ache, muscular pains, and loss of appetite; has a brown furred tongue, with raspberry tip and edges; ochrey-yellow diarrhœa; tympanites, with right iliac gurgling on pressure; epistaxis, slight bronchial râles over front of chest, malar flush, dilated pupils, sometimes delirium, evening rise and morning fall of temperature. The disease declines and disappears gradually in from six to twelve days, sometimes going on to twenty or thirty days. Only in cases over ten days have I found an eruption, the discovery of which is often a difficulty in the Irish peasant. As a rule, all the cases do well. The temperature rarely exceeds 103°, except in the prolonged cases.

The cause and effect are so palpable in connection with the country cases, and the absence of febrile symptoms in the lunacy cases, that I consider the subject may be of interest to this Section. Murchison speaks of " abortive enteric fever " occurring in country places, which is often spoken of as " febricula" or " simple con-tinued fever," but I cannot find in his work an account of circumscribed outbreaks, such as I mention, appearing under *like* conditions.

Remarks.—Clouston, in his work on " Fixed and Limited Delu-sions," gives the origin of monomania as arising in four different ways in different cases :—

1st. It is a gradual evolution out of a natural disposition—a proud man becoming insanely and delusionally proud, a naturally suspicious man passing the same borderland with his suspicions. This is the most common origin of the disease. There is usually a hereditary predisposition to insanity in those patients. The

disposition may, in fact, be regarded as the nervous diathesis out of which the disease springs.

2nd. It remains as a permanent brain result and damage after attacks of mania and melancholia, especially the former, from which the patients recover up to a certain point, but no further. This is the origin of one-sixth of the cases at Morningside Asylum.

3rd. It arises from alcoholic and syphilitic poisoning of the brain and body, from traumatic injuries of the brain, or sunstroke, or from gross lesions, such as embolic softening. Such patients usually have the delusional insanity of suspicion or unseen agency. They are the most dangerous class of monomaniacs on the whole.

4th. It may arise out of perverted organic sensations caused by constitutional diseases, characterised by lack of trophic power, and brain anæmia, notably tuberculosis, or out of perverted sensations from local diseases misinterpreted by the brain. As a matter of fact, a very large proportion of the cases of monomania of suspicion die of phthisis. Any man with an anæmic, ill-nourished brain, is apt to be morbidly suspicious.

" Two chief things, to be kept in mind in the diagnosis of mono-mania, are :—1st. Not to call any disease by that name that has not existed unaltered for at least twelve months ; 2nd. When there exists along with the delusional condition any general brain exalta-tion or excitement, or any general depression, not to call it by that name till those have passed off." [a]

Spitzka, in speaking of delusional insanity, states :—" Sufferers from hallucinations of hearing are particularly dangerous, and in subjective self-defence will kill or maim others, or to escape their persecutors may resort to suicide. Hallucinations of the agreeable type are generally more unfavourable as to prognosis, although their episodial results may be less serious from a medico-legal view. False taste and smell perceptions are common in hypochondriacal insanity and in paretic dementia. In the latter they have a bad import, and indicate rapid deterioration. This applies also to masturbatory insanity, of which disorder such hallucinations are almost characteristic.

[a] Clouston.

"In early times the aural hallucinations of the insane more frequently related to celestial voices. The introduction of the speaking tube was followed by a transferral of the voices to imaginary systems of tubing in the walls of the patients' apartments, and so on to the 'wire system' of the telegraph and telephone."

"The prospect of recovery is certainly very bad in cases of delusional insanity that have lasted over a year, but one is surprised sometimes by occasional recoveries after many years.

"There is a tendency to mental enfeeblement as time goes on. Many cases end in complete dementia after a few years, and in most the intensity of the conviction of the delusion and the aggressiveness with which it is put forward tend to diminish as time advances.

"Most monomanics live long—all but the cases of morbid suspicion, who, as I said, mostly die of phthisis.

"Delusions of annoyance by electricity, magnetism, or unseen agency, if they last long while the depression abates, are very unfavourable as regards prognosis. But so long as there is distinct depression, of which these delusions are an accompaniment, the case should be considered curable, and treated as such."[a]

From a limited study of works on the pathology of cases similar to those so feebly brought under your notice by me in this paper, I should say that if you look for "brain lesions" it will be to feel disappointed. In the books you will probably find an honest confession, gently broken to you in a long chapter glistening with newly-coined phraseology fresh from the mint, and concluding perhaps with a statement to this effect:—"All these *post mortem* appearances may be found in the brains of persons who have never been insane, nor can it be maintained that they indicate insanity."

[a] Clouston.

E

CASE OF CHRONIC INTERSTITIAL NEPHRITIS.

By Dr. C. H. ROBINSON, F.R.C.S.;

Member of the Court of Examiners, Royal College of Surgeons, Ireland ;
Late Lecturer on Anatomy in the Ledwich School of Medicine.

[Read in the Medical Section, April 29, 1887.]

THE lady, aged fifty-five, whose case is described in the following brief notes, was under my observation for years, the signs of the malady from which she suffered commencing with hypertrophy of the heart, followed by albuminuric retinitis, epistaxis, and finally cerebral hæmorrhage, which terminated fatally last November.

In the autumn of 1885 the sight of her eyes became considerably affected, and on examination by the ophthalmoscope, hæmorrhagic retinitis of both eyes was found to be present. At this time the urine passed was copious in quantity, pale in colour, of sp. gr. 1006, and on one occasion only was I able to detect any albumen, and then only the merest trace. At various intervals was it carefully examined with a negative result. Under appropriate treatment (which included the administration of the perchloride of mercury in combination with the iodide of potassium, the bowels being kept open by occasional doses of Friedrichshall water, and a spare dietary enforced), the sight, after several weeks, was restored, and the sp. gr. of the urine gradually became normal.

In January of 1886 I was sent for in consequence of a severe attack of epistaxis, which was arrested by plugging the anterior naris and applying an ice-bag over the cardiac region.

In October of same year I attended her for uræmic vomiting, and in the following month she called at my house about three o'clock, and when leaving complained of a numbness in the right leg. She wished to proceed into town, where she had some business to transact, but I persuaded her to go into the waiting-room, and in a couple of minutes there was complete anæsthesia as high

as the knee.   She remarked that she had dreaded this, and expected
to be paralysed.   I had to leave her for a few minutes, and then
found the right arm paralysed as well as the leg, also the face on
same side.   Her articulation now became impaired, but she could
put out her tongue, which was directed to the right side.   I had
her removed to her own house, where, on arrival, although unable
to speak, she appeared to be in a semi-conscious state.   About
seven o'clock the same evening she was perfectly unconscious; the
pupils contracted; pulse, 78; temperature, 95°; respiration fairly
quiet, occasionally stertorous.   During the night she exhibited
Cheyne-Stokes respiration, and the pulse gradually got higher, and
the temperature went up to 100°, then to 102°, while the face and
neck were greatly congested.   The eyes, which were now dilated,
had that peculiar fixed stare so characteristic in serious attacks of
cerebral hæmorrhage.   The right arm first was very rigid, but
gradually relaxed.   Death took place about thirteen hours after
the first seizure, being preceded by a violent trembling.

Some, perhaps, might regard the fatal result in this case as due
to uræmia, in which occasionally hemiplegia has been shown to
occur;[a] but the absence of convulsions, and the rapid increase in
the temperature would, I believe, show such an opinion to be
erroneous.

Albuminuria may exist, it is well known, without nephritis, but
the converse of this is comparatively rare.   Where no trace of
albumen can be detected in the urine, but the general symptoms
point to interstitial nephritis being present, the test recommended
by Feltz and Ritter, as modified by Prof. Bouchard, it is said, will
decide the matter.   The urine of a healthy person, when introduced
into the circulation of the rabbit by injection into the veins of the
ear, kills the animal in the proportion of 50 grammes per kilo-
gramme of weight, but that of albuminuric subjects can be tolerated
in much larger doses, and in one case mentioned by M. Dieulafoy
a rabbit of two kilogrammes, for which a toxic dose of healthy
urine would be 100 grammes, exhibited no discomfort until 260
had been injected, and even then recovered.

[a] Revue de Médecine, Nov., 1885.

A CASE OF LATENT TYPHOID FEVER, FATAL THROUGH CARDIAC THROMBOSIS.

By SURGEON-MAJOR R. HARMAN,
Army Medical Staff.

[Read in the Medical Section, March 25, 1887.]

THE subject of this interesting case was a dragoon, aged forty years, of splendid physique, who walked to hospital on the 13th November, 1886, and sought admission for slight eczema of the left leg, and, as this prevented him wearing his regimental boots, he was admitted. He was in good spirits, preferred to be " up," and asked for half-diet. The eczema yielded readily to treatment in a few days, and he would have been discharged from hospital only the medical officer in charge of the case noticed he looked somewhat anæmic, and, ascertaining that he had a cough, had, in accordance with the hospital usage, the temperature taken on several occasions, both morning and evening, without finding any rise above normal. The patient's tongue was perfectly clean, and during the whole time he was in hospital he had no diarrhœa, and never alluded to any abdominal pain or uneasiness. However, on the morning of the 29th November, after being up as usual, he was seized with vomiting, and appeared so ill that the orderly ran down for a medical officer, but the patient expired just as he reached the ward.

At a careful and exhaustive autopsy, made three hours after death, the chief features of interest were—the absence of *post mortem* staining; some brownish fluid clung to the moustache, but not of a bloody or fæcal nature; there was an excessive deposit of fat everywhere over the well-nourished body, especially underneath the abdominal integuments. Pleuræ healthy. The lungs were pale, and on section showed no congestion, but contained a little frothy mucus in the bronchi—weight of right, $12\frac{1}{2}$ oz.; left, 12 oz. The

pericardium contained about ℥ ij. of straw-coloured fluid. The heart was enlarged, 14 oz. in weight; muscular tissue softened, particularly on the right side; a decolorised clot extended through the tricuspid orifice into the right auricle, and thence into the venæ cavæ. This clot was adherent to the tricuspid valves, and was continued up the pulmonary artery to the lungs. The left ventricle was empty. The valves appeared generally healthy, except the mitral, which were thickened and opaque, but seemingly competent. The aorta contained a large recent clot.

The abdomen when opened showed the intestines protruding, uncovered by omentum, which was coiled up above the liver, and contained much fat. The small intestines were very much distended, presenting arborescent vascularity, which increased in intensity from above downwards, giving the bowel a deep red colour in the vicinity of the cæcum, and were coated on the surface with recent lymph, which glued many of the coils together. The parietal peritoneum was covered with thick masses of recent lymph, and gravitating in the lower portion of the peritoneal sac was about two pints of semi-purulent serum, without any suspended particles or fæcal smell. The ileum, just above the cæcal valve, presented on the anterior free surface of the bowel an oval open gangrenous ulceration, about three inches in length and half the circumference of the bowel in breadth, destroying all the coats of the bowel, and through the lumen of the bowel communicating freely with the peritoneal cavity. There was no extravasation of the intestinal contents. Another gangrenous patch, about the size of half-a-crown, was visible about eight inches above the cæcum, also situated on the anterior free surface of the bowel, but the dead tissues here still remained *in situ*. Upon slitting the intestines open the lining membrane of the ileum was congested and thinned, and at the site of Peyer's patches every stage of disease was seen, from infiltration and slight ulceration in the middle third, to gangrenous disintegration in the lower.

The small intestine contained some brownish-yellow liquid matter, and much fœtid gas. The lining membrane of the cæcum and lower part of ascending colon was softened and congested, and pre-

sented numerous ulcerations in the site of the solitary glands. The remaining portion of the large intestine was normal in appearance; it contained a small quantity of some dry black matter like tea in appearance. The liver was enlarged, soft, and friable—weight, 5 lbs. 10 oz. The spleen, which was firmly adherent to the stomach, was congested and pulpy—weight, $10\frac{1}{2}$ oz. Kidneys healthy in appearance—weight, 7 oz. each.

I confess that it needed some courage on the part of my colleagues and myself to present this case before the Academy of Medicine in Ireland, as it might at first sight appear that some symptoms had been overlooked, and that a mistake had been made. However, I took the trouble to hunt up all the patient's previous history, and I find that he had been always a hard drinker, and had lately abundant opportunities, as mess waiter, of indulging this propensity. He had always enjoyed good health, having only been in hospital 30 days during his 20 years' service, and with only trivial complaints. He had been always on home service, except when he was with his regiment in the Egyptian Campaign of 1882. For about a fortnight before his admission it is stated that he suffered from diarrhœa, but did his work in the Royal Barracks, ate his usual diet, and made no especial complaint. Hence, I submit the case is most interesting in many points—the absence of wasting, the man being able to be up and about, and the freedom from all subjective abdominal signs, and many objective ones—in the presence of such extensive and severe abdominal lesions, existing during some measurable time.

ON IDEAL PARALYSIS AND NEUROSIS OF THE VISCERA.

By WALTER BERNARD, F.K.Q.C.P., Londonderry.

THE histories of the two following cases will illustrate the import-
ance of early records, and how, in the one case, owing to the
patient's mental side, the physical cause was difficult to investigate;
and how, in the other, apparently slight functional disturbances
led up to long-continued, grave, and important changes, the causes
of which, unfortunately, were not discovered till after death. In
passing I may remark that if early note-taking were more common
among men engaged in active family practice, the gain would be
great to the patient, to the medical man in charge, to the compiler
of text-books, and to the hospital physician, to whom, at length,
the patient may be passed on with his intercurrent organic mischief,
and possibly with a record of his past history, which, in a clinical
aspect, would be of immense value to the hospital student, who has
no opportunity of following diseases brought before him through
their various stages. I fear we do not fully realise the importance
of early records, which are seldom to be found in the hands of the
general practitioner, and less so in those of the hospital physician.
Sir Wm. Gull, in speaking of life-histories, says there is a lurk-
ing dread of families exposing their frailties, which is almost an
impenetrable barrier to gaining facts upon which life-histories are
built, and the inquirer himself has a natural disinclination to
intrude into secrets which are so anxiously guarded, but fear is a
bad counsellor. May I be permitted to add also to this that, in my
experience, the inquirer himself is a good deal to blame, for not
taking more trouble to cultivate a taste for investigating, and for
not attaching sufficient importance to early symptoms, which are,

not unfrequently, not considered noteworthy. If you in the Metropolis could inspire us in the Provinces with more enthusiasm, we would have more records, and many more *post mortems*, which are not, as has gone forth, nearly so difficult to be had, and if men will only go the right way about it, they will find that, after all, the difficulties are not so great, and are much exaggerated.

The following case is interesting as regards the mode of onset, and the plan adopted to reason him out of his dominant idea, which called into action his paraplegia. On the mental side it was extremely difficult and tedious before we could investigate his lines of thought, and when he became communicative his physical condition was discovered without much trouble :—

Case I.—In September, 1885, J. M. was received into the London-derry Lunatic Asylum on the grounds of suicidal tendencies. He was unable to walk, and had to be supported by two attendants. For fully seven months, during the day, he always lay on his left side, never moving his body when watched, and preserving an inviolable silence. He seemed ever to be on the watch peering from under the bed-clothes, and casting penetrating glances all round. From his sulky curt answers, which were given in a half whisper, he gave me to understand he was fully of opinion that it was a mere matter of curiosity on my part which induced me to importune him, rather than to render him any real good. For many weeks I failed to get at his lines of thought, until Dr. Hetherington, the Resident Medical Superintendent, put me on the plan of enlisting the services of one of the inmates, whose attention and kind offices were fully appreciated by the patient himself, to inspire him with confidence in his advisers, and to induce him to move his body and limbs with more freedom than he had been doing. The means to this end had to be approached with much caution, and the blandishments of his friend, who took a lively interest in his task—more particularly as there was a good-service reward in question—were carried out with much patience, tact, and sagacity ; indeed, had it not been for this man, and Dr. Hetherington in the first instance, the probability is that he would eventually have become hopelessly bedridden, inasmuch as, if his thinking had not been analysed, he would have, in all probability, become a real, instead of an ideal, paraplegic. His loss of power had gone so far that he could not

stand without support, and his plan of education had to be carried out on the same principle as a child is taught to progress. It was no easy matter to train his thoughts to realise the fact that we were open and straightforward with him, endeavouring to do our utmost for his wellbeing, and making him to feel that his own efforts in time would be successful. He felt acutely the tones in which he was addressed. If questioned much his mental sensitiveness caused him to flush, and he became sullen, emotional, and irritable. Intellectually he shows no signs of weakness, and his answers are always to the point. He possesses also a good memory and judgment. His association of ideas is normal, and he can argue clearly and connectedly about other patients and circumstances which occurred in the ward. Once he very severely criticised the value of my examining the reflexes after epileptic seizures, and the discs in the general paralysis of the insane. Before I could get him to communicate his ideas to me, I ascertained, after many trials, that there were no positive signs of structural disease in the brain or spinal cord. It was at this stage of the investigation difficult to know to what the paraplegia was due. I could not associate it with paraplegia of the hysterical type, it being an extremely rare affection apart from organic disease and wasting. Had it been put down to this, and his seclusion and train of thoughts not investigated, we would have been feeding instead of curing his disease. There was no atrophy of his limbs; he could move them in any direction, and raise them slightly off the bed by placing his hands under each thigh. He had no bed-sores; electral reactions normal; ankle clonus did not exist, and knee-jerks were not exaggerated; discs physiological. Having had frequent opportunities of observing him, I came to the conclusion that his motor centres were acted upon by past and present ideas, and that a knowledge of those mental operations would be necessary before we could act on his keen perceptive faculties, and by degrees bring him to realise, through his intellectual processes, that there was no reason why, after some time, he should not walk like other people. When all suspicion had been removed, which was a tedious process, that we had no motive but to do him good, he became quite conversant and gave a very accurate account of his entire history, which fully coincided with that given by his friends. It is as follows:—

" I am now about twenty years of age. I had been a very healthy boy up to nine, going to school regularly, until on a very hot Sunday, in common with other boys, I commenced to bring stones up out

of the bottom of a well, ducking my head as you would for apples. The following morning my mother called me for school. I said I could not go, as I had a dreadful pain in my head. The pain did not improve, though a few remedies were tried. I became impatient, and felt that enough was not being done for me, so I became quite sad, cried, and wished that I was dead. But my state had no effect in frightening my friends to do more for me; I therefore pretended to do away with myself, but I never had any such intention. This plan was attended with some good results, for they got another doctor, who put a seton in my neck, which was the first remedy that gave me any relief. I got after some time better, and able to work; but I had a return of the old attack, became very depressed, and had no heart to do anything. My friends at last got tired of me, and placed me here in September, 1885."

When asked why he lay so long on the left side, he said it was to prevent the humour moving in the right side of his head, which movement gave him a burning pain in his right ear.

" Why was it that you gave up walking ? "

"I had no heart to walk. I could walk well enough when I took to the bed, but the long lying made me feeble on my limbs, and then when I tried to stand alone and walk I found I could not do so."

After much encouragement, and a happy knack of long training, he can not only walk up and down stairs, but stand on one leg. Periods of depression come on, followed by a slow rolling gait, with his head stooped and his eyes directed towards the ground. The greater the depression the slower the gait. He sometimes becomes so feeble that he will sit almost without moving for hours with his head resting on his hand and over his right painful solandic region.

This case is evidently a mixture of hypochondriasis and melancholia, the symptoms of the one being in excess of the other, and of a changeable order through the influence of fancy, fear, or some vague cause. It was not a typical case of hypochondriacal paralysis, inasmuch as the cloud did not settle down suddenly and lift off quickly, as in *paresis subitanea*, or, as Bunyan makes it, when Giant Despair "loses the use of his hands just as he is rushing at the pilgrims," but, on the contrary, it was slowly brought about by a physical cause, and fostered by an idea of neglect, out of which, had he been hypochondriacally insane, he could not have been reasoned. Hamlet-like, he feigned madness for a motive, and

according to his own strong assertions, he was only mad " north north-west, knowing a hawk from a hernshaw."

My object in bringing this case forward is to show that it might possibly be mistaken for structural disease of the brain or spinal cord, that the exciting cause was a physical one, and that the plan of treatment was to act upon the will—to make him will to walk.

There can be no doubt but the frequent and long-continued immersion brought on the attack, and after careful investigation it was proved that there was no hereditary predisposition to insanity, and that the boy, up to the time of his first illness, had been in perfect health.

Though there is no evidence of structural disease, he has a persistent uneasy feeling in the right side of his head, out of which a lesion may yet develop, and account for the gloom of melancholy and his miserable attitudes.

The chronic, dominant, erroneous idea that he was neglected by his friends was long perpetuated as an impression, and was so long retained by the organs of. special sense that its removal was only achieved by the steady conveyance of hope, much encouragement, kind words, and cheerful surroundings, and though his imagination occasionally carries him back to the old impressions in regard to the way in which he was treated by his family, yet he has power to rise above the level of such thoughts, and again resume a fairly cheerful disposition ; so that we are not without hope that he may yet be able to subjugate and control his will so far as to get rid of his painful impressions altogether, and separate his mind from the unreal to the real.

I shall not occupy much of your time with the following case, which will show how functional derangement, followed by hypochondriacal symptoms ended in unrecognised organic changes :—

CASE II.—The case of dilatation of the stomach, from which the gentleman succumbed, at the age of fifty-six, has an extremely long history. His first uneasy sensations date from his student days, and during the time he was a reporter for a newspaper. From his sedentary pursuits, excessive mental labour, and toiling hard through the greater part of the night, he became a dyspeptic,

and from much functional disturbance—including vague, inter-
mittent abdominal pains, flatulence, acidity, and constipation—he
seemed, from his own account, to have become mentally sensitive
of his condition; and, though not always complaining, he appeared
to have made his body too much a study, and I have no doubt was
a hypochondriac in a minor degree during some years of his early
career. But, being a strong-minded, well-educated man, he was
able to shake off the depression and morbid feelings caused by his
hard life, so that, with the assistance of fresh air and a little more
rest and change, he gradually improved, and did not think so
much about the working of the wheels and springs of his body.
In some short time after he became a minister of religion, when
his rural pursuits among country congregations brought him robust
health. He soon, however, again took to hard work as a professor
of theology and a writer for various periodicals, when decided
symptoms of gastric catarrh first commenced, about eighteen years
ago. The vomiting at first was not frequent—twice, or perhaps
three times in the year only. As time went on the intervals
between each attack became shorter, but he never ceased to work,
and with this exception, on the whole, his health and strength
were excellent, having a very good appetite—too good from what
I could learn—and eating hurriedly, so as to get back to his work.
His wife had to check him frequently for the rapidity with which
he swallowed his food. Again, even in the intervals of good
health, his mind seemed to dwell too much on his bodily condition,
and he made his diet and drugs a study, and now began not to
care to walk by himself. He sought further advice, among others
Sir William Jenner, who told him he had no organic disease, and
that he could eat vegetables, including cabbage and potatoes. He
had intervals of good health, but eventually the vomiting became
more frequent, the quantity larger, and brought up by three or
four efforts, about half an hour or an hour intervening between
each. The vomiting was accompanied with much abdominal pain.
The ejecta were sour-smelling, of a greenish colour, very acid, with
no bile, and full of sarcinæ. The exciting cause of bad attacks was
always put down by his friends to a hard Sunday's work, or pre-
paring for annual examinations. His bad seizures brought on
severe thirst, loss of appetite, and rapid wasting of the entire body,
and after many trials of remedies nothing could restore him to
health but a residence of three months on the shores of the
Atlantic. In this way he became better and worse for some years,

losing and gaining in health and strength—often becoming exceedingly sallow, anæmic, and thin ; yet he would again recover, put on flesh, lose his cachexia, and resume his work.

His diet consisted chiefly of peptonised gruel, milk, and other various peptonised foods. He lived on koumiss for many weeks at a time, which seemed to allay his thirst more than ice, but eventually all liquid nourishment disagreed so much that it was rejected, and had to be stopped. Before vomiting he had much feeling of nausea, and complained of a burning pain, to get rid of which he either put his finger down his throat or took an emetic. This exertion caused a good deal of distress, to avoid which I commenced, after much persuasion, to wash out his stomach with syphon action, using a solution of hyposulphite of soda. This afforded him much relief, and gave him a desire for food, and in time he was able to use the tube himself, drawing off early every morning a washing-basinful of sour fluid. When this was fully drained off he introduced a solution of carbonate or hyposulphite of soda, so as to cleanse the stomach thoroughly. This was again allowed to return through the tube into the basin beneath. His breakfast was then taken with a zest. It consisted of pulpified meat, one or two eggs with crumbs of bread, and a very little tea. This meal was fully digested. If, however, he took any food in the middle of the day or in the evening, it would make him feel quite uncomfortable, and he brought it up through the night undigested. Though he took no fluid, and but the one meal in the twenty-four hours, with a small quantity of fluid, yet the stomach secreted a very large quantity; I frequently measured six and seven pints. The stomach went on secreting for the twenty-four hours, but there was no absorption. Certainly, there seemed to be a great want of absorption.

The benefit of using the tube was remarkable, but he did not digest his meal with so much comfort when he used the hyposulphites as he did when he cleansed with the carbonate of soda, and if he used plain water the digestive process was slow and painful. The action of the soda in this case was in accordance with what the late Dr. Hayden remarked—namely, that alkalies in a similar case had promoted the free flow of gastric juice.

The diagnosis of dilatation was easily made out from succussion, percussion, and the splashing of fluid. After repeated examinations I could not detect the pyloric thickening, which you can now see was confined within narrow limits, but which, nevertheless,

caused the opening to be so narrowed that it would not allow a substance larger than a good-sized swan's quill to pass. I passed a piece of round wood through the opening to show how narrow it is. You will observe on the anterior surface of the pylorus the remains of a small ulcer, which gave way, and which had been adherent to the loose tissue under the left lobe of the liver. The adhesions must have been slight. It gave way early on the morning of the 3rd of last October, when he was suddenly seized with diffused abdominal pain, cold sweats, collapse, and prostration. He could not vomit, and only lived a few hours. The fluid contents of the stomach passed into the general cavity of the peritoneum, which seemed larger in quantity than on any previous occasion. Probably the over-distension of the stomach broke down, the adhesions allowing the fluid to make its escape. The heart, liver, and spleen appear healthy, but the kidneys, as you will observe, are full of large and small cysts. The urine was at all times healthy, with the exception of being occasionally loaded with lithates. The microscopic specimens show fibroid thickening only of the pyloric portion. The coats of the stomach are not hypertrophied, the thickening being due to prolonged immersion in spirits; indeed, the duodenum is more thickened than the stomach itself. All the parts were healthy, except the one spot which caused the obstruction, and which some here to-night may say should have been removed by operation. The diagnosis, however, was not made during life, even by Sir William Jenner.

My reason for bringing this case also under your notice is chiefly because those already recorded do not date from an early stage, and to elicit discussion on the practicability of operative interference in similar cases, and if the dilatation of the stomach was primarily due to irritating substances, producing spasmodic closure of the pyloric end.

To sum up, it commenced as chronic dyspepsia, encouraged and probably brought on by intense mental strain. Fibroid thickening of pyloris next set in, which in time produced dilatation. The ulcer, which proved fatal by bursting, owed its origin in a large measure to the dilated and unhealthy condition of the stomach. In addition to the morning out-wash an evening one would have lessened distension at least to one-half, and would have averted, probably for a time, the fatal bursting.

A CASE OF CALCULOUS PYELITIS, FOLLOWED BY ALBUMINOID DISEASE.

By JOHN WILLIAM MOORE, B.A., M.D., M.Ch., Univ. Dubl.;

Fellow and Registrar of the King and Queen's College of Physicians;
Physician to the Meath Hospital.

[Read before the Medical Section, April 29, 1887.]

THE following case presented so many features of clinical as well as of pathological interest, that I judged it not unworthy of consideration by the Academy of Medicine. Debarred by the rules of the Pathological Section from entering upon clinical details in a communication to it, I have resolved to lay the case before the Medical Section, as the omission of the clinical history would rob the present short paper of much of its interest. For the notes of the case I am largely indebted to my Clinical Clerk at the Meath Hospital, Mr. St. George Gray, and to Mr. Joseph Francis Mannix, the Clinical Pupil in charge of the patient.

John D., aged seventeen years, a porter by occupation, residing at 84 Francis-street, Dublin, was admitted into Ward 18 of the Meath Hospital, under my care, on Thursday, March 24, 1887. He was exceedingly ill—wasted, blanched, and weak. On being questioned as to the duration of his illness, he said that his legs began to swell a fortnight previously, when also severe pain in the left groin set in. His appetite was bad, and he could not sleep on account of the pain in his left groin and hip. The bowels were free, and the motions had an offensive smell and an unhealthy appearance. There was extreme emaciation; he appeared very bloodless, with long dark eyelashes, and a generally phthisical aspect, but no cough was complained of. He was very thirsty—a symptom of diagnostic importance.

Physical examination showed the lungs to be apparently healthy.

The pulse was rapid, small and variable in volume—not unlike that of mitral regurgitation. In favour of the diagnosis of this lesion, also, was the discovery of a loud, rather harsh, though blowing murmur, systolic in time, audible at the apex as well as at the left base of the heart, but particularly so on a line with, and a little inside, the left nipple. As time went on, this murmur proved very inconstant as regards intensity.

Passing from the wasted thorax, the observer was struck by the fulness of the abdominal cavity, especially in the epigastrium, which was remarkably prominent. The fulness was in part accounted for by the presence of considerable tympanites, but dulness on percussion in the flanks revealed a moderate ascites, and the right hypochondrium, the epigastrium, and the umbilical region, were all occupied by a vastly-enlarged liver, firm—even hard to the feel, perfectly smooth, and of uniform dimensions. It was easy to get the fingers under its rounded lower margin, and to map out the right and left lobes and the interlobular notch. The first touch of the liver suggested the probable existence of albuminoid change in the organ. At the same time it was ascertained that the spleen was certainly not to any extent enlarged. The urine, however, was found to be highly albuminous, showing on microscopical examination a few hyaline tube-casts, but *no pus corpuscles* or blood-cells. It was acid in reaction, and its specific gravity was only 1010. There was moderate anasarca of the lower extremities, and the left leg was flexed, as in hip-joint disease— vital ankylosis.

The diagnosis lay between mitral regurgitation, with passive congestion of the liver and consecutive chronic nephritis, on the one hand, and albuminoid disease of the liver, kidneys, and intestines on the other.

As there was no apparent suppurative or syphilitic history to account for the latter disease, a provisional diagnosis of mitral regurgitation was made. The patient was accordingly put on a mixture containing quinine, digitalis and nux vomica, and "Potus Imperialis" was prescribed to allay thirst. The liver apparently lessened somewhat in size after a few days.

On April 2 there was a sudden and marked increase of diarrhœa of a very unhealthy, offensive kind. The stools were not examined for pus. The patient's diet was now changed—arrowroot, rice, and boiled milk being substituted for beef-tea. A mixture of tincture of perchloride of iron, glycerine, and chloroform water was also given, instead of the former combination.

On April 8, John D. seemed better, had more appetite, and even asked for " meat," which was ordered for him at his urgent request.

On April 12 the diarrhœa once more became very bad, and the lad's days were evidently numbered. Aromatic chalk powder, gum acacia, catechu, and cinnamon water, were given in draughts, but without checking the diarrhœa. Stimulants also failed to relieve, and he gradually sank, dying at 6 30 a.m. of Saturday, April 16. For several days before his death it was quite evident that the malady was not valvular disease of the heart, but albuminoid disease of an unexplained origin, affecting the liver, kidneys, and intestines. Adopting this view finally and absolutely, I pronounced the cardiac murmur to be of hæmic, rather than of organic origin.

A careful autopsy was made five hours after death by Dr. James Craig, one of the Assistant Physicians to the Hospital, and Mr. Gray, Clinical Clerk. The thoracic and abdominal cavities only were examined.

The *lungs* were practically healthy. The *heart* was small, weighing $5\frac{1}{2}$ ounces. The usual white spot on the pericardium was very distinct, and there were traces elsewhere of past slight inflammatory action. Both ventricles and auricles contained blood-clots, evidently formed at the moment of death. The endocardium was strikingly pale and bloodless, but otherwise nealthy. There was no valvular roughening—both the mitral and the aortic valves being quite normal, as was also the aorta, with the exception of two or three specks of atheroma.

The *liver* was greatly, yet uniformly, enlarged. It weighed 7 lbs., was very firm and hard, and yielded a pink coloration with aniline blue. The *pancreas* and *spleen* were inseparably welded together by old adhesions—they weighed jointly $13\frac{1}{2}$ ozs. The spleen was slightly congested—its capsule was thickened and

F

presented appearances of former perisplenitis. It showed the characteristics of the " sago-spleen " of albuminoid disease. The pancreas was firm, almost cartilaginous, and the neighbouring glands were enlarged.

But the interest attaching to the examination attained its climax when the *kidneys* and their environs were reached. The left kidney, or what remained of it, was embedded in a mass of dense, cartilaginous-looking connective tissue. On cutting through this, the organ itself was found almost entirely destroyed, converted into a multilocular cyst with intervening bands of chondroid connective tissue. The cysts contained a horribly fœtid urino-purulent fluid, and branching calculi were found in some of them. The pelvis of this kidney was obliterated, as the result of old-standing calculous pyelitis, and the ureter also was thickened and widely dilated down to a point about $2\frac{1}{2}$ inches above its entrance into the bladder, where it was completely occluded by a smooth oval calculus. This was of a bluish black colour (from deposition upon it of a sulphide), so resembling a piece of limestone rounded by the action of the sea. Passing downwards from the *tunica adiposa* and invading the sheath of the left psoas muscle, a fœtid perinephritic abscess had tunnelled, so causing the pain and stiffness in the left hip-joint. The presumption is that during the closing weeks of the patient's life this abscess had partly evacuated itself by the bowel, but a careful examination with a catheter failed to discover any opening— valvular or otherwise—into the intestine. The absence of pus in the urine was satisfactorily explained by the complete occlusion of the left ureter, as above described. The left kidney and its surrounding connective tissue weighed 6 ozs., but the right kidney weighed more than twice as much—$14\frac{1}{2}$ ozs. It had evidently undergone compensatory hypertrophy to a very marked extent; but in time its fate also overtook it, and at the moment of death it was the seat of albuminoid disease, only in a less degree to the liver.

My Clinical Clerk, Mr. St. George Gray, made at my request a careful histological examination of the various organs which were principally engaged. The staining solutions used in the investi-

gation were aniline violet and lithium carmine. His sections of
the liver showed extensive albuminoid change, chiefly affecting the
intermediate zone of the lobules. The outer zone, on the contrary,
was the seat of a fatty deposit. Sections of the large intestine,
stained with aniline violet, showed a pink coloration of the edge
of the mucous membrane, due to the presence of albuminoid
material. There were in the pancreas only slight traces of this
substance, but the connective tissue of the organ was apparently
increased in amount. The spleen was extensively invaded by the
albuminoid material, and its capsule was much thickened. The
left kidney was converted almost wholly into fibrous tissue, but
still showed traces of renal structure, which were in places the
seat of albuminoid change. The uriniferous tubes which remained
were in many instances widely dilated. The right kidney pre-
sented the albuminoid reaction with aniline violet to a very great
extent, particularly in the papillary portion and as regards the
Malpighian corpuscles and the straight tubules. Many of the
uriniferous tubes were plugged with hyaline casts.

SOME NOTES ON THE MINERAL SPRINGS OF AUVERGNE.

By M. A. BOYD, F.R.C.S.; M.K.Q.C.P.;
Physician to the Mater Misericordiæ Hospital.

As the season has arrived when medical men are in the habit of suggesting for their patients additional therapeutic agents, in the shape of mineral waters, as a concomitant to change of air and scene, I thought a few notes on the many valuable springs of Auvergne, which I visited in the Autumn of last year, would not be uninteresting to the Academy.

Owing to the ease with which it can be reached from Paris by the " Paris, Lyons, and Marseilles Railway," and the number and variety of the springs that exist in this volcanic district, Auvergne offers, in my opinion, one of the best localities on the Continent in which to choose a mineral water that will suit the therapeutic indications of most of the ordinary ailments physicians are called on to treat.

Situated in the midst of the most beautiful mountain scenery in France, and within easy reach of each other, these springs offer many attractions to the invalid as well as to the daily increasing number of fashionable valetudinarians who consider a course of mineral waters absolutely necessary in their annual existence.

To one of the springs of this region (Royat), now so well known, I need not allude, as its character and therapeutic properties were so ably and graphically brought under your notice by the late President of the College of Physicians, my friend, Dr. Cruise, in a paper read by him before this Society last year, that I could add nothing that he has not called attention to. There are other springs of this region to which it was his intention to allude in a future commu-

nication, and I trust he will not consider that it is in any spirit of anticipating him that the few remarks I have now to offer in connection with them are made.

The other springs to which I wish to allude are La Bourboule, Monte Dore, and Chatel Guyon. The first of these springs, La Bourboule, is now beginning to share with Royat an equal amount of popularity. The attention it is receiving at present from medical men in England as a water particularly suited for the treatment of obstinate skin diseases is calculated to make it ere long one of the most flourishing and fashionable, as it is at the present one of the best, of the many springs of Southern France for such cases.

Though for many years recommended by the Paris physicians for the value of its waters in such affections, it is only within the past seven or eight years, coincident with the growth of its increased accommodation and the easier means of reaching it now by railway from Clermont, the capital of Auvergne, that its value as a powerful arsenical spring has been recognised in these countries.

The value of its waters is enhanced by its situation in the most mountainous part of Auvergne, being about 2,600 feet above the sea-level, and the invalids who now go there can reach it in thirteen hours from Paris. Laquelle, which is the railway station for both La Bourboule and Monte Dore, is distant only about five miles from either place, and comfortable omnibuses convey visitors from the station to both of these places on the arrival of trains. The Bourboule springs have two sources—the source Perrière and the source Choussy—both identical in chemical composition. The Perrière spring supplies 388 quarts per minute, at a temperature coming from the earth of 140° F., and both springs, in addition to containing arsenic with the chlorides and bicarbonates of the alkalies, contain large quantities of free carbonic acid, which renders them sparkling and limpid in appearance.

The first chemical analysis made of the Bourboule waters, in 1853, showed them as containing a large quantity of arsenic—a quantity equal to 21 drops of Fowler's solution in each quart of

the water; the largest quantity contained in any mineral waters now known.

Professor Berthelot, in giving his opinion of the origin of the arsenic in these springs, says :—" The conclusion at which I have arrived is that the soluble arsenic contained in the Bourboule waters takes its origin from the interior of the earth. It is brought up in the waters through the fissures in the granite, and is not produced by their contact with disintegrated earth, schistes, and other materials situated above the granite." Soundings were also made through the granite formations at a depth of 250 feet below the surface by M. Perrière, who found the pure arsenic waters at this depth. Nine-tenths of the solids contained in these waters are salts of soda, with ammonia, potash, and lithia, with lime, magnesia, alumina, and traces of iron, while the acids contained in them represent arsenious, hydrochloric, and carbonic. In 1856, M. Gonod discovered in the sediment of these waters the presence of iodine. Professor Gubler, when studying the composition of these waters, considered the salts contained in them corresponded to the salts found in the blood. The waters may be described as a thermal, alkaline, arsenical, chlorinated, bicarbonate, gaseous water.

Ten years ago La Bourboule was only a mountain village with a few houses and one hotel; it is now a town of fine hotels, of which there are over fifty, with two parks, a theatre, and casino, with twelve or thirteen medical men, several of whom speak English. As indicating the rapid growth of the place, statistics show that in 1865 only 600 patients underwent the course of treatment, while in 1877 there were over 2,800, and last year there were over ten or fifteen thousand visitors. In 1875 the first respectable bathing establishment was built by a Frenchman, Dr. Choussy, and a few years later, in 1879, a company purchased his interest in the place and built two other establishments, one of which, the Grand Establishment, is capable of accommodating over 300 bathers at a time, and is completely fitted up with all modern improvements. The waters for drinking are brought into the central hall of this establishment, and all round are situated both rooms and halls for

inhalation of the waters in a state of steam and apparatus for pulverising it for throat and laryngeal cases, with rooms for ascending, and local douches and wet and dry massage; the latter form of treatment is carried out on the most approved principles by skilled masseurs, so that any physician desiring such a mode of treatment for his patients can have it carried out here in perfection. Dr. Choussy left a record of the cases treated by him at the spring for a period of over twenty-nine years, and nine-tenths of these cases were scrofula, rheumatism, and gout, especially the cutaneous manifestations of these diseases. Special mention was also made of their beneficial effects in cases of chronic rheumatic arthritis. The springs are also held in high repute for the treatment of intermittent fevers, chronic coryza, hay fever, nasal and pharyngeal catarrh, strumous or tubercular joints, bronchial catarrh, asthma, and emphysema.

Judging from my own observation of the cases I saw there, skin diseases, especially psoriasis, eczema, and lichen, seemed the more numerous, with numbers of cases of naso-pharyngeal catarrh, for whom the waters, in the form of nasal douche and spray, seemed admirably suited. I also noticed numbers of cases of suppurating cervical glands. As showing the beneficial effects of these waters on cases of all kinds of skin diseases, the medical men from the other watering places are in the habit of sending them there to be cured; and my friend, Dr. Brandt, of Royat, told me that many cases of psoriasis and chronic eczema that were not cured at Royat rapidly got well by an after-course at Bourboule.

The waters have generally to be taken cautiously at first, beginning with half a glass three times a day, increased to a glass, and their high temperature and saline taste are rather agreeable to some. If taken in too large a quantity they cause colic and diarrhœa; but most patients, even atonic dyspeptics, bear them well, in whom they produce a feeling of warmth in the stomach, and sharpen the appetite. The usual course of the baths and waters is twenty-one days, when saturation is supposed to be reached.

As the altitude of Bourboule is high, the season does not begin

till June, and ends with September. The autumn months are generally considered the best, and medical men sending patients there should recommend a supply of warm clothing, as the evenings are generally cold.

The waters bear exportation well, and keep a long time, and are, in my opinion, a most suitable form in which to administer arsenic, from the ease with which they can be assimilated by the most delicate stomachs. Either source will do, as they are both exported, and it is quite immaterial whether the brand indicates the source Perrière or Choussy, as the waters are identical. They can be obtained in Dublin from Thwaites ; also at Hamilton & Long's, and other medical establishments.

MONTE DORE.

Monte Dore, which is four miles higher up in the same valley (the valley of the Dardogne River) than Bourboule, is reached in the same time from Paris. It occupies, however, a higher altitude than the latter, being about 4,000 feet above the sea-level, and enjoys a cooler climate. Its waters are below those of La Bourboule in temperature, being 113° F. as they come from the earth. Like the Bourboule waters they contain arsenic, but in smaller quantity, and in combination with iron, which latter exists in the Bourboule waters as the merest trace; they are, therefore, considered more tonic than the Bourboule waters, but are not, in my experience, so easily assimilated nor drunk by the visitors in such quantity.

The springs of Monte Dore were known to be three in number since the last century. They are now nine, and the united quantity of water they give is equal to that of Vichy. The Cæsar spring is the best known, and contains the largest quantity of free carbonic acid. The Raymond spring, which is the most ferruginous, is the one most generally drunk, in conjunction with the Madeline, which contains much less iron. These three springs are the principal ones. The springs of Monte Dore are very ancient; they were known to the Romans, and the remains of their baths are still to be found in tolerable preservation, where they were

hewn out of the solid rock, at the foot of which Monte Dore is built. The bathing establishment at Monte Dore consists of two parts—the establishment proper, and another building called the vapour establishment. In the first were found the remains of the Roman picina, where the waters came hot from the foot of the mountain. In 1877 two new halls were added to the pavilion built in 1856, with 36 bathing closets, which originally contained only seven baths hollowed out of the rock. These new halls contain from 50 to 60 bath-rooms, with a picina or bathing place, one of which is reserved for the poor gratis.

The vapour establishment is, however, the great feature of Monte Dore. It was opened in 1852. On the ground floor of this establishment are two galleries, upon which sixteen vapour douching closets open, eight on each side; between these two galleries are two pulverising halls, one on each side, for each sex, for the treatment of affections of the throat and naso-pharynx. Each inhaling hall gives access to another smaller room, where patients can breathe a less thick and hot vapour. Each patient, before entering these halls, is provided with a suitable waterproof dress, worn over their ordinary clothing. A hundred patients at least can find place in each inhalation hall. In 1877 the number of these inhalation halls was increased.

The objects of inhaling the waters in a state of steam is to get absorption of their chemical constituents into the blood through the bronchial mucous membrane, and to medicate the bronchia and lungs locally for any disease of them.

That the waters have a sedative action on the bronchial mucous membrane, administered in this form, we cannot deny, and the doctors of Monte Dore ascribe it to the carbonic acid present in the waters. They illustrate the sedative and anæsthetic action of carbonic acid, applied locally, by getting patients with neuralgia of the face to hold the painful part over a tube placed over one of the springs as this gas escapes from it coming from the earth, and into which it is received, and they find after a few minutes complete relief from pain, while considerable anæsthesia of the parts are produced. They also use what is called a carbonic acid bath

to relieve neuralgic or gouty pains occurring in the joints or muscles.

Monte Dore enjoys a high reputation for the treatment of asthma, both of the spasmodic and bronchial kinds, and judging from its sedative action on the bronchial mucous membrane, when applied in the form of steam inhalations, its good effects in the latter form are undoubted. In the spasmodic form of the disease which we now know is so often dependent on the presence of poisons in the blood, derived either from ptomaïnes, or on the unoxidised products of urea circulating in the blood, my own impression of the efficacy of the waters in this affection is that they play a very doubtful part in the cure, which is, I think, more due to the bracing mountain and the better oxidisation of the blood and better assimilation of food which takes place in such a high altitude. Dyspepsia, on any diet, in such an altitude is consequently unknown, and quickly disappears after a short stay in Monte Dore.

The Monte Dore doctors speak in glowing terms of the curative effects of the waters, when inhaled in the form of steam vapours, on ulcerating tubercular cavities in the lungs. My own impression is that change of air and the high altitude have more to say to any beneficial effects that are the outcome of their use than of anything contained in the waters themselves. There is one feature in the manner of using these steam vapours which, judging from the recent lights thrown on the pathology of phthisis, is certainly to be condemned—namely, crowding a number of cases of lung affections into a close, moist atmosphere.

We know such an atmosphere is just the very one in which the bacilli of phthisis is most at home, and there is every reason to suppose that mild or non-infected cases are likely to become the receptacles of the microbe, if they are not so already, by breathing such an infected atmosphere. I expressed such an opinion to one of the medical men there, and he agreed with me, and said the authorities of the place were taking steps to fit up separate inhalation rooms for each phthisical case, instead of having them, as at present, all crowded together.

The medical men of Monte Dore do not consider the presence of hæmoptysis any contraindication for the use of the waters, as they act, in their opinion, as astringents, both internally and topically, and they treat active hæmorrhage from the lungs by immersion of the feet in the rock-hewn baths, where the water comes directly from the earth at its highest temperature, considering the revulsive action thus produced acted like the application of a Junod's boot. Besides cases of phthisis, most of those I saw at Monte Dore were cases of bronchitic asthma, emphysema, laryngeal affections—including tubercular ulceration of the larynx—laryngo-pharyngitis (clergyman's sore throat), rheumatism, uterine affections, palpebral conjunctivitis, and also chlorosis. The place enjoys a great reputation amongst singers for its effects on all laryngeal troubles, and judging by the numbers who come there they must derive benefit from it.

The season at Monte Dore begins late (end of June) and is generally over by beginning of September. The hotels in Monte Dore are numerous and good, but the village itself is a dirty and an uninteresting one.

CHATEL GUYON.

The third spa which I have mentioned on my list—Chatel Guyon—is situated in a charming and picturesque valley of Auvergne, about six miles by road from Royat. Riom would be its railway station coming from Paris. Chatel Guyon is called by the French physicians the Kissengen of France, and its springs are very numerous, bubbling up in all directions over the place. The waters of the river Sardou are quite unfit for domestic purposes, owing to the number of them that rise in it close to the town; unlike Kissengen, its waters are hot and not nearly so bitter or disagreeable to the taste. The amount of carbonic acid contained in the waters, and which escapes from the earth in every direction, makes the ground, especially in the large bathing establishment, quite hot under the feet. Their taste is slightly salt and acidulated, leaving a styptic after-taste. If drunk at the spring, the saline taste is masked by the carbonic acid present; but if allowed

to stand for some time, the gas escapes and the saline taste reappears. The waters, as analysed by Dr. Maguier de la Saurce, of the Laboratory of the Paris School of Medicine, shows them as containing a large quantity of chloride of magnesium (30 grs. to the quart), to which their aperient action is due. They possess, also, very considerable diuretic properties. This analysis also shows them as containing, besides the chloride of magnesium, chloride of sodium and bicarbonates of lime, soda, potash, and iron. The waters may be described as a gaseous, sodic, and magnesian chlorides, mixed bicarbonated and ferruginous water. When kept in a closed vessel, these waters deposit their iron with a small quantity of carbonate of lime and magnèsia. For this reason the waters do not look well when exported, if kept for any length of time.

After taking a few glasses of these waters hot from the spring, there is a feeling of intestinal gurgling, followed by an abundant bilious discharge, with either copious diuresis or a free action of the skin. Although the peristaltic action of the bowels is rapid, it is neither preceded nor accompanied by griping or pain.

The stomach feels no inconvenience from the use of these waters, except in cases where the drinkers take too large quantities at short intervals. In some cases of obstinate constipation the laxative effect is not produced the first day, but when it is once produced it continues uninterruptedly without pain or inconvenience.

The internal effect of these waters is considerably assisted by the action of the baths, which, from the large quantity of carbonic acid gas present in them, has a most exhilarating effect on the bather, producing a feeling of what the French call *bien être*, which none but an atonic dyspeptic can sufficiently appreciate. Owing to this effect, when used as baths and taken internally, the waters are largely availed of by dyspeptics, and for many such cases these waters are superior to Royat, the waters of which, as you know, have no aperient action.

The cases that seemed to me to frequent Chatel Guyon were cases of obstinate constipation, and the medical men of the place speak in high terms of their effects in such cases, and state that

when once the habit of a daily evacuation is produced by their use the good effects continue after leaving the spring.

I also noticed a number of people who came there to get cured of obesity, for the treatment of which the waters enjoy a considerable reputation, and Professor Gubler considers them especially useful in cases of Bright's disease and diabetes. The waters also occupy a high position in the opinion of gynæcologists as a remedy in endometritis, uterine catarrh, leucorrhœa, and dysmenorrhœa.

In concluding these remarks I have only to add that those who visit Auvergne, either for health, recreation, or amusement, will not come away disappointed; and the invalid who cannot find among its many mineral springs one to suit his particular ailment is not likely to find it elsewhere; but he cannot fail, at all events, to come away much impressed by its splendid scenery and improved by its bracing mountain air.

A CASE OF PITYRIASIS RUBRA.

By WALLACE BEATTY, M.D.;

Senior Assistant Physician, Adelaide Hospital.

As pityriasis rubra is rare, I think an account of a case of this disease, which came under my observation, may not be without some interest.   Two cases only of this disease have been published before in Dublin—one by Drs. Benson and Walter Smith, the other by Dr. Finny.   My patient's history is as follows:—

Mrs. B., aged seventy-one, was admitted into the Adelaide Hospital on April 15th last.   Except for an eruption on her head which she had when a baby, and for an attack of measles, she was quite strong and healthy up to the age of twenty-six, when about six weeks before the birth of the only child she ever had, she received an injury to her abdomen when travelling by train from Belfast to Portadown.   Two men were fighting in the railway carriage and fell on her.   She was much hurt and had to be helped out of the carriage.   After that day, however, she was able to be up and about (feeling at times abdominal pains), until the birth of her child, which took place at full time.   The child lived only two days.   She says the flesh of the baby was wrinkled on its face and body, as if it had been a fine child up to the time of the hurt; it had not any eruption on its body.

A few hours after the baby was born inflammation of the bowels, she said, set in, and some time after her left leg and arm became swollen, the leg being most affected; it was leeched several times. For several months after her confinement she was unable to leave her bed, as, in addition to the affection of her leg and arm, her womb, she says, gathered, and a very great discharge came from it.

Turpentine stupes were used for the abdominal trouble after

birth. The turpentine brought out a rash on her abdomen, which spread to the chest and extended down the arms. The rash finally settled upon the backs of the hands, leaving the other parts. The eruption continued on the hands for rather more than two years. She then came up from the country to Dublin and consulted the late Dr. A. Colles, who, she says, expressed surprise at her coming to Dublin for such a trivial complaint. He cured the affection for her. Since then, until the skin affection which I am about to describe commenced—*i.e.*, till about a year ago—she says she has enjoyed good health, with the exception that, from time to time, she has had attacks of diarrhœa. These attacks did not confine her to bed, except on one occasion, two years ago, when she was very ill therefrom under Dr. Pollock's care in Blackrock. She has also been subject to bronchial trouble, "her pipes wheezing," as she expresses it; this, however, did not lay her up or cause a feeling of illness.

About a year ago an eruption appeared on her skin, commencing on the skin adjoining the vagina; thence it spread to the thighs and legs, abdomen, chest, and arms, and finally to face, thus becoming universal; her face was only affected about ten days before her admission to the Adelaide Hospital.

The patient, on her admission to the hospital, presented a very remarkable appearance. With the exception of the face, scalp, hands, and feet, the description of whose condition I shall give presently, the entire surface of the body was of a red colour, the depth varying somewhat in different parts, and more or less copiously covered with thin, dry, papery, white scales of various sizes. The red colour of the skin was seen best where the scales were wanting—viz., the axillæ, the under-part of the mammæ, along with the surface in contact with it, the inner surface of thighs and the back of the knees; these flexor surfaces were almost entirely free from scaliness. Elsewhere the scales were very numerous and close together; they were of irregular shape, and varied in size, the average being about one-third or one-half inch in diameter; but there were some much larger, others smaller. The scales were partly attached and partly free; their free ends stood

out at an acute angle from the surface, and in many the edges were curled. They could be removed readily without pain. On removing the scales the surface on which they rested was soft, but there was no perceptible moisture.

On close examiuation they were seen to be marked in a retiform manner, with very fine and closely-set ridges, evidently correspond-ing to the lines of the skin. The back, hips, and external surface of the thighs, the shoulders, and chest were remarkably scaly, and indeed the appearance was not at all unlike as though pieces of tissue paper, torn into small pieces of various sizes, were partially stuck on to the skin close to one another, and left partially free. On looking at the back, from the neck down to the hips, the scales, which were present in remarkable quantity, were seen to be larger towards the lower part. Like the chest, shoulders, and back, the abdomen was covered with scales, but they were smaller and not quite so closely set together, so the red colour of the skin beneath was rather more obvious. The forearms and legs were also affected in like manner to the rest of the body—the scales here were not very large—on pressure the red colour faded to yellow. The legs and feet were œdematous, and pitted deeply on pressure. As to thicken-ing and infiltration of the skin, it was considerable in the forearms, but elsewhere was slight. On the scalp the scaliness was marked round the borders, but on the vertex the scales were small, and mixed up with some that were seborrhœic. The scales of the borders were mostly of an elongated form, partly detached, and where detached looked almost of silvery whiteness. The surface under these scales was smooth and shiny. The face presented a remarkably tightened appearance, which was due to the fact that the epidermis was not enfoliated as upon the rest of the body, but was in most places simply cracked here and there, the borders only of these cracks showing white from the epidermis here being detached from the skin beneath to the extent of only about half a line. On the forehead the surface looked pale, the epidermis dry, cracked here and there as though about to desquamate. At the borders of these cracks, where the epidermis was slightly free, it showed, as stated above, white, so that the forehead showed a net-

work of whitish, almost silvery, lines. To the touch the surface had somewhat of a parchment-like feel. Round the eyes the epidermis was partly detached to form scales. The cheeks had much the same appearance as the forehead. On the chin the epidermis was cracked, mainly in a vertical direction, so that the scales, only free at the lateral margin, were arranged more or less vertically; the chin had a remarkably tightened look. Indeed, the skin of the face generally was stiff, dry, and had a tightened drawn appearance. The auricles were thickened, covered with white scales on both surfaces. At the back of the lobule of the left auricle the surface was eczematous; it was moist, with sero-purulent exudation. Behind the right auricle were two vertical fissures. The appearance which the feet presented was as follows:—The dorsum, as far as the end of the metatarsal bones, was red, and covered with white scales as on the rest of the body; on the dorsum of the phalanges the epidermis was dry, and cracked here and there. The sole and borders of the foot were not scaly, but the epidermis presented a dry, wrinkled look, and here and there it was cracked, and the cracks showed white borders.

As to the hands, on the dorsum there were a few white scales, and the skin was here and there cracked deeply, showing dried blood clots in the fissures.

On the phalanges the epidermis was of a yellowish colour, and wrinkled, and only here and there cracked. The palm of the hand had much the same appearance as the phalanges, except in the centre, where the epidermis was partly separated to form scales.

On the legs especially, and here and there on some other parts, were seen very minute pin-point sized hæmorrhages in the skin.

The subjective sensations were mainly itchiness, which was marked, and disturbed her rest at night for the first few days after admission.

I may say there was no albumen in the urine. The heart, too, was quite healthy.

From the above description it will be observed that with the exception of the nails the entire external surface of the body was

affected.   There was no sign of disease seen on the mucous membranes of the nose or lips.

On admission to hospital, I prescribed three minims of the hydrochloric solution of arsenic with 20 grains of bromide of potassium thrice daily.   The latter I ordered to relieve the itchiness. For about four days there was no change in the condition of the skin, except as regards its irritability, which was greatly lessened. After about four days improvement commenced, the skin became paler, and new scales ceased to form.   The improvement was exceedingly rapid.   I did not adopt any local treatment until April 22, by which time an improvement had already begun.   The local treatment was limited to the lower extremities for some days, and consisted in washing with soft soap and the application of zinc ointment.   Subsequently she was given warm baths, in which soap was freely used.

About a week after her admission into hospital, but after improvement had already begun, she got a slight attack of bronchitis. She was given iodide of potassium for this, the arsenic and bromide being continued at the same time.

In the beginning of May she was very much better.   Her face had quite recovered its natural condition, except for a few minute scales here and there on the forehead.   The œdema of the legs had almost disappeared, and the scaliness on the body was limited mainly to the lumbar region.   On about 10th May her mind, which was before quite sound, became disturbed.   She began to have delusions— *e.g.*, imagining the patients in the ward with her were whispering about her, and at night she wished to get up and put on her clothes. I stopped the bromide on the 12th, continuing the arsenic.   On May 16th her mind was greatly disturbed; her pulse was very jerky and incompressible.   Dr. Head saw her with me, and advised me to stop the arsenic, and give her a good purge, which I did.

After her bowels had been well moved, her restlessness almost entirely ceased, and her mental condition became almost restored. Still, every now and then she had delusions.   She left the hospital on May 21st.   I saw her husband the next day.   He told me, except for occasional delusions, she seemed quite well, and in very

good spirits. On the day she left the hospital the cutaneous affec-
tion was entirely gone from every part of her body with the excep-
tion of the back of the knees and legs, where there was some redness
with scaliness. Dr. Walter Smith, who kindly saw her that day,
can verify my statement.

The eczematous condition behind the left auricle only lasted a
few days, as long as the stiffness of the auricle remained. There-
fore, it must be regarded as secondary.

The points of interest in this case, in addition to the rarity of
the disease, seem to be—

1. The advanced age of the patient. She was seventy-one.

2. The rapidity with which the disease disappeared under the
use of arsenic and bromide. Certainly she got iodide of potassium
as well, but it was not given until after improvement had already
begun. It may be noted that improvement had already begun
before local treatment was commenced. The local treatment was
limited to baths, soap, and zinc ointment.

3. The fact that with the disappearance of the cutaneous affection
mental derangement occurred.

The universal involvement of the skin, its freedom from moisture,
and the fact that the scales were exclusively exfoliated epidermis,
seem to me to distinguish the affection from eczema, to which
disease it bore the closest resemblance.

Note.—Aug. 13—I heard to-day that the patient ls quite well. Her mind,
soon after she left the hospital, became quite restored. —W. B.

SURGICAL SECTION.

NOTES ON A CASE OF OVARIOTOMY.

By FRANCIS VICTOR MACDOWELL,

Surgeon, Baltinglass Union Hospital, Co. Wicklow.

At the last meeting of this Section I exhibited a large ovarian tumour removed by me from a patient in Baltinglass Hospital on 22nd March last, and in attempting this evening to lay my notes before you I trust to your indulgence for the many shortcomings contained therein.

I am tempted to bring the case before you—

1st. From the surrounding difficulties that had to be met and contended with;

2nd. That abdominal section, in its fullest sense, is an undertaking not often attempted in provincial hospitals; and

3rdly. The rapidly-successful issue of the operation.

Case.—On 11th January, 1886, M. T., single, attended at dispensary seeking an admission card to lying-in ward of hospital. She gave her age as forty years, and stated that when thirty years old she had had a living child, which survived its birth but a few hours. Four or five years ago she suffered from effects of premature confinement, after recovery from which her health became irregular.

She was admitted to hospital on 12th January. Her family history was not very promising, her father having died at an early age from pneumonia; the mother also died in early life.

The patient first suffered actual trouble two and a half years ago, by an irregular tumour springing up, internally and on the

left side, until it assumed such enormous dimensions that from the mere mechanical pressure on the organs of the chest, pelvis, and abdomen, her blood became impoverished, and the nervous system shattered by imperfect assimilation.

In stating her age, I may say she looked fully ten years older, the apparent difference being due to the whiteness of her hair, the painful and worn expression of countenance, and the general emaciation existing. When the enlargement first commenced the menstrual functions ceased, and the patient was much troubled with urinary and intestinal derangement. As this was the first occasion upon which she had consulted me, I deemed it advisable to make a careful examination. She was of medium height; circumference immediately below umbilicus was 42 inches, and in this situation the longest circular measurement was obtained. There was an increase of measurement between the two cristæ ilii and umbilicus, that on the left side being longer; there also was considerable alteration in measurement between umbilicus and sternum and umbilicus and pubes, an increase of some inches being observed between the former points. The tumour projected forward, being smooth and rounded. The flanks were not distended. Pressure with the hand communicated a sense of great and unyielding resistance. Fluctuation indistinct, and offered no resistance. This was afterwards accounted for by the thickened and distended condition of the cyst walls, and by the extensive adhesions existing. Percussion elicited a dull sound over the entire tumour, and its note was not affected by change of posture.

Respiratory movements were oppressive and modified, thereby sounding the warning note of adhesions to the diaphragm. The size of the tumour, however, greatly impeded free action of the lungs. As the recumbent position was most distressing to the patient, and attended with much dyspnœa, I was unable to conclude examination this day.

On making a vaginal examination, I found that by pressing one finger firmly on the cervix uteri, and moving the abdominal tumour with the other hand, the uterus remained unaffected by the movements. Above and to the left of the uterus a feeling of elasticity was communicated to the hand. The os and cervix uteri were found in a healthy state. The sound was passed with facility into the uterine cavity, and the uterus was perceptibly moved away from the tumour.

I now informed the patient as clearly as I could of the nature of the disease she suffered from, advised her to submit to an operation for removal of the tumour, and recommended her to consult with her friends.

I lost sight of her for six weeks, when she again entered hospital and expressed her anxiety to have her condition relieved. During this short time the symptoms of impending exhaustion became more marked, and her condition more miserable; appetite bad, sleep unrefreshing, and attacks of dyspnœa on lying down.

I will not weary the Section by recapitulating the precautions I adopted before performing the operation.

On 21st March patient was placed in a bright, well-ventilated room. The attendant was a nurse, specially trained by me for such cases, so that we had a trustworthy nurse, pure air, and a good apartment in our favour.

On 22nd March, the temperature of the room being maintained at 75°, the atmosphere was impregnated with carbolic spray and rendered moist with steam. All the instruments were carefully disinfected with carbolic oil, and the sponges were kept in a basin containing a very weak solution of bichloride of mercury. Having for my assistants Drs. Weldon and Clibborn, the patient was placed in a semi-recumbent position and in a good light. Dr. Weldon administered his favourite anæsthetic—chloroform and ether in equal proportions to produce full anæsthesia—the effect being afterwards kept up with plain chloroform. I now made an incision in the linea alba from lower margin of umbilicus to within one inch of pubes. After the usual dissection and evacuation of peritoneal fluid the tumour was exposed, bulging through the abdominal opening. I endeavoured to insinuate my hand, and afterwards the handle of a scalpel, between the growth and abdominal walls, but failed to do so, and, as owing to the density of the cyst walls I was unable to insert the trocar, it was found necessary to make an incision, and having therein fastened the canula with the spring hooks, I was hopeful of being able to extract the tumour without further trouble. After the greater portion of the fluid, amounting to twelve pints, had drained off, and the cyst becoming more flaccid, an effort was made by gentle traction to release all existing adhesions, but in this I was disappointed, and I found it necessary to enlarge the abdominal incision by the left side for two inches above umbilicus. Having completely evacuated the con-

tents of cyst and broken down all adhesions, which were very extensive, the whole tumour was drawn out and its pedicle was secured with a clamp. Owing to the thickness of the pedicle it was deemed advisable to secure it with four strong carbolised cat-gut ligatures. It was now divided, and any superfluous portion between clamp and ligatures being removed, the actual cautery was applied, and the pedicle secured outside the abdominal incision and in its lower angle with two harelip pins which embraced the incision as well, and around all the ligature was twisted. Before thus securing the pedicle an opportunity was afforded of inspecting the right ovary, and it was found in its normal site free from disease. The abdominal cavity was now thoroughly cleansed from any fluid or clot it contained, and for this purpose many soft sponges were used in succession. The wound was now closed by drawing together the edges of peritoneum and abdominal incision, and for this purpose fine sutures of carbolised gut were again used. The entire wound was dusted over with iodoform, over which was placed a pad of carbolised tow, the whole being maintained *in situ* by a closely-fitting flannel binder. A ½-grain morphia suppository was now applied, and the patient, still unconscious, was gently removed to her bed.

The further history of the case is one of uninterrupted recovery. Temperature never exceeded two degrees above normal. On the 4th day some gastric trouble set in, but it was quickly allayed by means of large linseed poultices laid over abdomen, together with administration of iced champagne and opium. The sutures came away on 8th day, cicatrisation being almost completed on 21st day. The patient, still comfortably supported with binder, left her bed and moved about the ward. On 22nd April Dr. Weldon wrote me :—

"Rathvilly.

"My dear MacDowell,

"Was very pleased to find to-day, on my calling at Baltinglass Hospital, that your ovariotomy patient was up and quite convalescent. The result must be very gratifying to you, as it is only three weeks since the operation. Three weeks later the patient, on her way home, called at my residence and walked to it—a distance of one mile."

In observing this case I was irresistibly impressed by two facts—one, that had tapping been resorted to it would have been necessary to make an incision in the tumour through the abdominal walls, and this would have left poor hope for the patient; the other, the thoroughly aseptic condition in which the stump of the pedicle was preserved by the action of the iodoform.

ON NEPHROLITHOTOMY, WITH REPORT OF A CASE.

By **KENDAL FRANKS, F.R.C.S.**;
Surgeon to the Adelaide Hospital.

[Read in the Surgical Section, November 12, 1886.]

In reporting the following case and in shortly discussing some of the chief points in connection with the operation, I do so because the history of nephrolithotomy is of such recent date that every case ought to be published in which the operation is resorted to, and also because the present case is the first in Ireland in which a stone has been excised from the kidney in the living subject. The term "nephrolithotomy" was proposed by Schurigius as far back as the earlier half of the eighteenth century, but the operation itself was performed for the first time by Mr. Henry Morris in 1880, and the details reported by him to the Clinical Society of London in the same year. Mr. Morris defines nephrolithotomy to be "an incision into the secreting substance or pelvis of the kidney, with the express purpose of removing a calculus therefrom; and that too at a date in the progress of the disease prior to the disorganisation of the renal substance, or the conversion of the renal pelvis into a large abscess cavity." Although of so recent an origin, the operation has already been performed a sufficient number of times, in England, in America, and on the Continent, to show that it is not only a justifiable proceeding, but one fruitful of the best results, and free from risk to an extent hardly to be anticipated.

It is reported that the late Mr. Lawrence used to begin one of his lectures thus: "The kidney, gentlemen, is fortunately beyond the reach of the surgeon."[a]

That day is past, and the kidney has ceased to occupy such a distinguished position. There are four well-recognised methods of

[a] Ashhurst's International Encyclopædia, Vol. V., p. 1,090.

operative interference with the kidney. (1) *Nephrotomy*, or simple incision into the kidney, whether for diagnostic purposes, for the opening of an abscess, or for hydronephrosis. (2) *Nephrorraphy*, designed for the purpose of fixing a movable kidney. (3) *Nephro-lithotomy*, and (4) *Nephrectomy* or excision of the kidney. I do not purpose in the compass of this paper to discuss the several procedures, but I shall confine myself to that one only which is illustrated by the case which I now desire to report :—

Case.—J. H., a man, aged twenty-eight, by occupation a silk weaver, was admitted to the Adelaide Hospital in the autumn of 1885, and first came under my care on the 5th of October of the same year, suffering from loss of flesh, increasing debility and pain in the left side. His history was as follows : He had always been healthy till five or six years ago, when his troubles began. He had been in the habit of indulging largely in stimulants, with occasional intermissions, sometimes extending to a period of three months. His drink was invariably ale. In the winter of 1879–80, during one of his drinking bouts, he caught a very heavy cold which confined him to bed for a fortnight, with shiverings, fever and pains all over the body. At the end of the fortnight sup-pression of urine came on and lasted for three days. At the end of this time it was again secreted, and when passed was bloody. For the first day the blood was passed in clots, subsequently it came mixed with the urine, and did not entirely disappear for three months. During this time micturition was not unusually frequent, nor was the act accompanied by pain. There was no vomiting, but the bowels became constipated and sometimes would not act for three days. Concurrently with the hæmaturia, severe and paroxysmal pain came on. It began in the left groin and hip, and sometimes shot down into the left testicle. When suffi-ciently well to move about, he noticed that the pain frequently shifted from the testicle to the crest of the ilium and up into the left side near the spine. This pain has continued more or less ever since, but sometimes it is absent for a few days.

Two and a half years later he contracted a gonorrhœa, of which he has not been cured. The passage of a bougie revealed a stric-ture six inches from the meatus, which just allowed a No. 7 English gauge to pass.

For some time previously to his admission to hospital he had

been gradually getting weaker. During the previous week he had been lying up at home unable to eat or drink, and vomiting whatever he took. Previously to this he had had no vomiting. The day after coming into the Adelaide Hospital he was seized with retention of urine, and a catheter had to be passed every day for about a week. At this time he complained of symptoms which suggested vesical calculus, and accordingly he was sounded on two occasions, but nothing abnormal could be detected in the bladder.

His family history was good.

When first he came under my care he was very anæmic. His large dark eyes, with clear bluish conjunctiva, his white lips, and colourless, pasty face was highly suggestive of phthisis. His lungs, however, were sound, and he had no cough. His appetite was fairly good, and when not in pain, he slept well. Whenever he stood or walked the pain in the side came on. It sometimes seized him in the loin, sometimes in the groin or over the iliac crest, but it never shot into the testicle during the whole period that he was under observation. His pulse was 106, and the temperature normal.

The urine he passed contained pus, the amount of this constantly varying. Sometimes it formed but a thin layer at the bottom of the urine glass, and again after twelve hours standing it would occupy nearly a third of the column of fluid. The specific gravity was 1017. The urine was always acid, though sometimes extremely fœtid. The microscope revealed pus cells and crystals of uric acid, but there were no pyriform cells and no tube casts. I was first inclined to look upon the case as one of tubercular pyelitis, as on account of the constant acidity of the urine and the absence of all vesical symptoms, it was evident the pus could not come from the bladder; whilst the cachectic appearance of the man was suggestive of tubercular disease. At my request Dr. Wallace Beatty, on two occasions, carefully examined the urinary deposits for bacilli, but none could be detected.

He never passed any calculi or gravel.

I kept him under observation till the 27th of October, when he left hospital, but attended occasionally as an out-patient. He was treated at first with benzoate of soda, which materially diminished the fœtor of the urine, but did little good otherwise. This was subsequently changed for salicylic acid and salicylate of soda with the same result. Astringents of various kinds, including pyrogallic acid, seemed to have no effect.

He was re-admitted to hospital on the 10th of April last, as he was decidedly losing ground, was obviously weaker, and the pain seemed to be getting worse. The urine had not improved, and pus continued to be passed in large quantities. I now came to the conclusion that the case was one either of purulent pyelitis of the left side or of renal calculus, and that it was a case in which an exploratory operation should be performed. Before, however, resorting to this expedient, I asked my colleague, Dr. Wallace Beatty, to examine the case and to give me his opinion, and I am glad of this opportunity of acknowledging the material assistance and support which he afforded me.

An examination of the abdomen and back revealed nothing abnormal; there was no fulness or tumour or anything. The only thing elicited by this examination was tenderness behind on pressing over the last rib and below the last rib, immediately external to the erector spinæ. There was tenderness nowhere else. The pain was referred to the same region, extending over the lower half of the left side of the thorax, and in the left side of the abdomen below the left costal arch. It was occasionally absent. The pain was described as burning or aching. He could lie with greatest comfort on his back, and better on his left side than on his back. Lying on the right side increased the pain. The character of the urine was the same as when in hospital in October.

From the character and localisation of the pain, from the condition of the urine, and from the history of the onset of the disease five or six years previously, Dr. Beatty considered that the weight of evidence was in favour of a renal calculus. Under these circumstances, and with the concurrence of my colleagues, I operated on the 6th day of May last, as follows :—

The patient was placed under the influence of ether, lying on his right side in a semi-prone position. Pillows were placed beneath the right loin and abdomen, in order to throw the left loin well out and to support the kidney, so that it should not slip forward when reached. An incision was then made parallel to the twelfth rib, three-quarters of an inch below it, and beginning over the external border of the erector spinæ muscle. This incision was five inches long and extended forwards to a point a little superior and posterior to the anterior superior spine of the ilium. The muscles were divided to the full length of the incision and then the lumbar aponeurosis appeared. It bulged out into the incision, and looked so like the colon that for a few moments I

was undecided as to its nature. By tracing it backwards, however, I found that it passed behind the kidney, and the doubt being thus removed I divided it freely. The perirenal fat at once came into view, and was carefully torn through by means of fingers and forceps, thus exposing the kidney, which looked quite healthy. Passing my finger behind it, I broke down some adhesions, and was then enabled to explore its posterior surface thoroughly. At its inner border my finger impinged upon a hard mass, which at first felt like the spine, but passing the finger downwards its lower limit could be felt. It appeared to be about two and a half to three inches long. An exploring needle was then passed through the substance of the kidney, and as it reached the inside of the pelvis it grated against a calculus. An incision about two inches long was made on the outer border of the kidney down to the pelvis. The hæmorrhage at first was very brisk, but a finger passed through the wound served as a plug, and it quickly became checked. The stone was friable and chalky, but was so firmly imbedded in the pelvis that it had to be crushed with a forceps and removed piecemeal. A large piece occupying the upper portion of the pelvis I succeeded in hooking out with the finger, but most of it was removed with the aid of a lithotomy scoop. The calices of the kidney seemed to contain processes from the stone, and I experienced great difficulty in enucleating them. When I was satisfied that all was clear I irrigated the wound in the kidney with a weak solution of corrosive sublimate to wash out the *debris*. By this time the bleeding from the substance of the kidney had nearly quite ceased. Accordingly, I plugged the wound lightly with some sal-alembroth gauze wrung out in weak carbolic lotion. A drainage-tube was placed from the deep parts of the wound external to the kidney and brought out at the external angle of the skin wound. All divided tissues were sutured in successive layers with catgut. The wound was dressed with sal-alembroth gauze and a large, thick pad of turf mould was placed over all and the parts firmly bandaged with a flannel roller. During the whole operation, which occupied just an hour, the patient's pulse remained remarkably good. The subsequent progress of the case was most satisfactory.

The external wound healed by first intention, with the exception of the track of the drainage-tube, which was not finally closed till between the fourth and fifth week. For the first few days the dressings had to be changed two or three times a day owing to their rapidly becoming saturated with blood-stained urine, but by

degrees the dressings became less frequent, and by the fifth week were abandoned altogether. The day after operation I found him lying on his right side, his favourite position since the operation, though previously he could not do so owing to the aggravation of pain which it induced. Mr. Piel, the assistant to the Professor of Chemistry in the College of Surgeons, very kindly analysed the urine passed day by day *per viam naturalem.* The evening after operation it contained a large quantity of blood, but this rapidly diminished and ceased to appear on the fourth day. On the tenth day the pus was scarcely noticeable in the urine, but since then it has reappeared though in much less quantity. As soon as the external wound had healed he passed a normal quantity of urine daily, and the amount of urea excreted varied from one to two and a half per cent.

The patient has now been back at his work for several months. He has begun to fill out and looks healthy, though still somewhat anæmic. The other day I met him running hastily down some steps very different in appearance to what he was in May last. The pain in the side has completely disappeared. A good deal of the stone was lost in the process of washing away the *debris* from the pelvis of the kidney, but all that was collected was carefully washed and dried by Mr. Piel, who found that it weighed then 171·3 grains. It is composed of carbonate of lime, phosphate of lime, and ammonium magnesium phosphate.

The operation of nephrolithotomy has already obtained a well-established position in surgery. The statistics hitherto have been exceptionally good. Up to the beginning of the present year twenty-two cases were recorded by English and American surgeons. Of these none died as a direct result of the operation. Two died shortly afterwards, one from morphinismus (Pepper) and the other from a calculus becoming impacted in the ureter on the opposite side (Cullingworth). The other twenty cases made good recoveries. In German literature I can only find two cases reported. The first was operated upon by Bardenheuer,[a] but the patient died of anuria, and the autopsy showed that a calculus was impacted in the opposite ureter. The second case was operated upon by Lauenstein in January last and a large calculus removed, the

[a] Centralblatt f. Chirurgie, 1882, No. 12.

patient making a most satisfactory recovery. It would thus appear that the danger of nephrolithotomy consists more in our uncertainty as to the presence of calculus in the second kidney than to any inherent risks in the operation itself. To obviate this Mr. Knowsley Thornton operated for the removal of renal calculus by combined abdominal and lumbar sections in March, 1885, with complete success, but in this I scarcely think he will find many to follow his example, as, from the experience afforded by nephrectomy, the abdominal operation is much more risky than the lumbar, and the additional risk incurred by opening the abdomen in addition to the opening in the loin more than compensates for the additional knowledge which may or may not be gained by so doing.

The great difficulty, however, in nephrolithotomy will always consist in the diagnosis. We may fail to recognise the symptoms as renal, as in a case reported elsewhere, where a woman is said to have had both ovaries removed before her troubles were finally dissipated by the extraction of a stone from her kidney. Or we may feel perfectly certain of the existence of a renal calculus, and yet an exploratory incision may fail to reveal it. This has happened already several times, and in one case reported in the Transactions of the Medico-Chirurgical Society for 1885, Mr Henry Morris, having failed by manipulation and by the help of an exploring needle to detect any stone, excised the kidney and subsequently found a calculus hidden away in one of the calices. He recommends that in future, instead of excising an otherwise healthy kidney, a free incision should be made into it, opening up the calices one after another until the stone is found.

The case which I have now reported illustrates the fact that we cannot rely altogether on the classical symptoms of stone in the kidney. The only symptoms which an examination of the various cases hitherto published shows to be present in all these cases are pain radiating from the position of the kidney in the loin, and tenderness on pressure over the kidney. The diagnosis in each case has been helped out by other symptoms; in mine, for instance, by the acidity of the urine and the pus it contained, but none of these are constant except the pain and the tenderness on pressure.

CONSERVATIVE SURGERY IN DISEASES OF THE FOOT AND ANKLE-JOINT.

By W. I. WHEELER, F.R.C.S., M.D., M.K.Q.C.P.,

Surgeon and Lecturer on Clinical and Operative Surgery, City of Dublin Hospital ; Consulting Surgeon to the National Lying-in Hospital.

BEFORE entering into the essential details of the conservative surgery of the foot, it will not be out of place to refer briefly to some of the anatomical points more especially bearing on the subject. Putting aside the freely movable joints of the toes, there are three joints in connection with the tarsus that are capable of free movement in a direction of flexion and extension. The first is the ankle proper, between the tibia, fibula, and the astragalus ; the second is the transverse tarsal joint, between the os calcis and cuboid and the globular head of the astragalus and the scaphoid ; the third and last joint being that between the tarsus and the metatarsus. The other articulations of the tarsus permit of extremely limited motion (only), and their actions subserve the purpose of elasticity of the tarsus as a whole rather than actual movement. The joint that is most intimately connected with the intrinsic movements of the foot is the astragalo-scaphoid, consisting, as it does, of an almost enarthrodial articulation, partly composed of an extremely elastic ligament (the inferior calcaneo-scaphoid), which allows of considerable increase of mobility on account of its elasticity. The surface of the astragalus is much larger than the scaphoid, but its free movement on the latter is allowed by the ligament just mentioned.

In connection with these joints the synovial membranes become important. The largest and most complex is that which lines the anterior surface of the scaphoid, passing forward in three processes—

one between the cuboid and external cuneiform, one between the middle and internal cuneiform, and the third (by far the most important) passes forward, lining the contiguous surfaces of the middle and external cuneiform bones, and then passes between the anterior surfaces of the external and middle cuneiforms and the proximal surfaces of the second and third metatarsal bones, and also passes between the surfaces of the second, third, and fourth metatarsals. This synovial sac varies but seldom, sometimes allowing the prolongation between the internal and middle cuneiforms to join the expansion between the second metatarsal and anterior surface of the middle cuneiform, and thus the middle cuneiform may be surrounded with a complete synovial membrane. By means of this sac the following bones are in communication by their synovial membrane :—Second, third, and fourth metatarsals, the three cuneiforms, the cuboid and scaphoid—in fact, all the tarsus anterior to the transverse tarsal articulation. The other synovial membranes are not of such importance—(1) between the internal cuneiform and first metatarsal, (2) cuboid and third and fourth metatarsals, (3) calcis and cuboid, (4) posterior surface of astragalus and calcis—except one, that which lines the concave surface of the scaphoid, the convex head of the astragalus, the anterior articular surface of the scaphoid, and the calcaneo-scaphoid ligament. On account of the close bond between the bones of the tarsus by means of ligaments, the synovial sacs become related to a much greater extent of ligamentous structures than is the case in other articulations.

With reference to the arches of the tarsus, the antero-posterior arch is maintained not alone by the fascia, muscles and ligaments that run in an antero-posterior direction, but also by the strong tendon of the tibialis anticus which is inserted into the keystone of the arch (the internal cuneiform bone); and the preservation of this arch is necessary for the existence of the transverse half arch which completes the tripod of which the internal cuneiform is the apex. In this connection may also be mentioned the tendon of the peroneus longus, which, by its insertion into the base of the first metatarsal bone, forms the opposing point to the half arch of the tarsus.

H

To epitomise what I have written—the tarsus, for practical purposes, may be divided into four separate or distinct synovial sacs, no one of them communicating with the other.

In nearly all the cases of disease of the foot that have come under my notice, the osseous structures were primarily affected, and not the articulations; and on considering the arrangement of the synovial membranes, as above described, it will be readily understood that the original starting-point of disease will greatly influence its extent; thus, disease in the calcis extending to the cuboid will for a lengthened period be limited to these bones; but should disease commence in the middle cuneiform or in the bases of the second or third metatarsal bones, the rapidity of its progress will soon implicate the centre of the inner and front part of the tarsus.

Having thus briefly reviewed the anatomy of the parts, the first consideration that presents is the comparatively recent date that marks any attempt to advance the conservative surgery of the foot to the same level as that of its analogue in the upper limb—the hand. In a point of surgical interest, the foot is in no way of less importance. Its intrinsic movements, no doubt, are less; but, excluding the proper movements of the thumb, those of the foot are not inferior. Anatomically it is composed of just as complicated a series of structures; its powers of repair are not unequal to those of the hand; but, until recent years, the surgeon who would preserve the smallest portion of the hand with scrupulous care, would condemn the entire foot to amputation without sufficient hesitation. At no very distant date no distinction was made between the diseased portions of the foot, and those who suffered from diseased tarsus were indiscriminately condemned to amputation of the leg— the wealthy and affluent who could afford suitable artificial limbs, above the ankle-joint; to the poorer classes, just below the knee; and thus not only was a limb perfectly sound removed, but the risk to the patient materially increased. And thus this practice prevailed until Chopart drew decided attention to the propriety of treating limited disease of the tarsus by operation other than amputation of the leg, when he introduced the medio-tarsal operation, or

that called by his name. Then came Symes' operation, another advance in conservative surgery ; and, without doubt, the introduction and use of anæsthetics also assisted. But it is not my intention to enter into any detail or to discuss the modifications and relative merits of these many excellent operations devised for removing only the diseased structures of the foot—such as Lisfranc's, Hey's, Pirogoff's, the subastragaloid, Chopart's, and others too numerous to be mentioned—but to shortly relate some of the more interesting cases of disease that have occurred in my own practice, the operations necessary for the removal, and the results.

I. COMPLETE EXCISION OF THE OS CALCIS FOR CARIOUS DISEASE.

CASE I.—A. T., a young lady, aged nineteen years, above the middle height, of healthy appearance, suffered from carious disease of her left os calcis, which was said to have been excited by a fall when skating. Two years subsequently, when I saw her, an abscess had formed on the posterior and external surface of the os calcis, and had burst. On passing a probe into the small aperture which existed, the bone could easily be felt denuded and roughened to the extent of about the size of a shilling. An incision was made in the site of the opening, and potassa c. calce applied, commonly called Kirkpatrick's treatment, but more correctly it should be accredited to Munro *primus*. This line of treatment had not a beneficial effect. The disease extended, and I was obliged to excise the entire bone, which was done by making a semilunar incision, carried from a little anterior to the calcaneo-cuboid articulation to a point corresponding on the opposite side. I dissected the flap forwards, and opened the calcaneo-cuboid articulation, divided the ligaments, and removed the bone. Dr. H. Benson administered the anæsthetic ; my pupil, Mr. Corry, assisted me. Free drainage was established, and the foot placed on a splint. The operation was performed in 1875 ; in three years after the young lady walked almost perfectly. The heel of the boot on her right foot was made as low as possible, that on the left added to sufficiently to compensate for the deficiency.

II. REMOVAL OF THE RIGHT OS CALCIS FOR CARIOUS DISEASE.

CASE II.—G. A., a sailor residing in Dalkey, was admitted into the City of Dublin Hospital, under my care, on the recommenda-

tion of my friend and colleague, the late Mr. Tufnell, in 1877. There was not any history of injury. He stated that a sudden pain came in his heel, which he attributed to cold and wet when fishing; and this was followed by abscess, forming a sinus which led down to roughened bone on the inferior surface near the centre. The sinus was enlarged, and sulphuric acid injections resorted to; afterwards iodine. The treatment did not control the disease; the bone softened, and became carious to a greater extent. I decided to excise it, which I did after the manner before described. The under-surface of the astragalus was roughened at the inferior posterior surface, which I removed, taking off a thin section of bone by means of a fine saw. The patient made an excellent recovery, and may be seen at Dalkey following his accustomed avocations.

III. EXCISION OF THE OS CALCIS FOR DISEASE WHICH ATTACKED THE INFERIOR AND EXTERNAL SURFACE, THE ARTICULAR SURFACES BEING HEALTHY.

CASE III.—R. T., a young gentleman, aged twenty-one years, born of healthy parents, about five feet eight inches in height, of sallow complexion, by whom I was consulted, in October, 1880, for pain over the external portion of his right os calcis, on which surface was a small opening which occasionally closed and then again burst, discharging a thin fluid. He was seen by Mr. Butcher, who advised injections and subsequently removal of the diseased bone by the gouge. A month after I first saw him—that is, about the 20th November, 1880—he was placed under an anæsthetic by Dr. Harley. Mr. Butcher and Mr. Tufnell were present. It was now ascertained that the disease was so extensive that excision of the bone should be practised, which I did by the subperiosteal method. The external incision, which was curved, commenced on the outside of the tendo-Achillis, at the level of the ankle-joint, and was carried down to the tuberosity on the external surface of the os calcis, and as far forwards as the base of the fifth metatarsal bone. The flap having been raised, I separated the periosteum carefully. This operation was long and tedious. The periosteum did not strip off easily from the bone, as we are wont to observe in disease. Small particles of bone remained adherent to the periosteum. The drainage was not as satisfactory as in the other cases. The progress of the case was slow, and portions of bone were thrown off during the treatment to cure, which was even-

tually accomplished in three months after the operation. In two years after the operation (1882) the patient walked well. I could not satisfy myself that there was any reproduction of the bone. If called on again to excise the os calcis, I would not adopt the sub-periosteal method. I do not believe in the advantages claimed for it, and to my mind it has many disadvantages; besides, the periosteum is often diseased, and does not, after operations, always carry out its wonted functions. [The excised bones were exhibited at the Pathological and Surgical Societies.]

IV. COMPLETE EXCISION OF THE RIGHT ASTRAGALUS FOR DISEASE.

CASE IV.—In March, 1881, I was consulted by the parents of a healthy young lady, nineteen years of age, for caries of her right astragalus. The exciting cause of the disease appears to have been a blow over the bone a year previous, which occurred when running upstairs, when she slipped and fell forwards, the edge of the stair step causing a severe contusion over the front of her ankle-joint. This accident confined her to bed for a week, after which period she resumed her active country life. She continually felt stiffness and aching pain in the neighbourhood of her ankle-joint, especially after exercise. Two months before I saw her—that is, early in January, 1881—without any known immediate cause, an abscess formed in the front of her ankle, which rapidly ran its course, and burst in about a week after the first acute symptoms, leaving two sinuses. On entering a probe into the most anterior, that part of the astragalus just behind the head could be felt exposed, and on passing a probe into the sinus situated anteriorly and externally, the denuded bone was easily reached. Having examined this patient on two occasions, I advised the removal of the astragalus. The lady was anæsthetised by Dr. Harley, Mr. Butcher was present, and Mr. Kelly (now Dr. Kelly), my former pupil, assisted. I made a somewhat curved incision from the external malleolus, and extended it to the outer border of the foot, passing through the sinuses. I divided portion of the external lateral ligament of the ankle-joint, the peroneus brevis tertius and short extensor of the foot. The extensor tendons in front and the dorsalis pedis vessel were not injured. The peroneus longus muscle was retracted posteriorly. I next turned the foot forcibly inwards, and divided the ligamentous attachments, and then seizing the bone with a lion forceps I drew it forwards, and further divided

any structures necessary, being careful not to injure the plantar arteries on the inner side. There was not any hæmorrhage of consequence. A few muscular branches were ligatured; the cavity, which I had previously examined, I washed out with a solution of chloride of zinc, 15 grains to the ounce in strength; free drainage was established; and the foot and limb was placed on a splint, such as is commonly used in excision of the ankle-joint. The wound progressed kindly, and in a little less than three weeks had completely healed. Before the end of the fifth week I applied a plaster bandage, which remained on for six weeks, and which allowed of some slight motion. Suffice it to say that the result is all that could be desired—the limb but little shortened, her powers of locomotion scarcely impaired, and a movable articulation exists between the os calcis and malleoli. The lady, who is in town at present, I saw about a week ago.

V. MEDIO-TARSAL OPERATION.

CASE V.—The next case which I shall record is one which required the medio-tarsal, or Chopart's, amputation, which I performed some five years ago for disease commencing in the middle cuneiform bone, which extended to the external and internal cuneiform, 2nd and 3rd metatarsal and scaphoid bones. The subject of this operation was a delicate lad about eleven years of age. There was not any history of injury. The result of this operation was seen at the Surgical Section some two years ago. The photograph here shown represents the stump three months after the operation. There was no tendency to contraction. When bringing the flaps together, I sutured the tibialis anticus and peroneus longus to the cicatrix.

VI. EXCISION OF THE OS CALCIS, ASTRAGALUS, AND PORTIONS OF THE TIBIA AND FIBULA FOR DISEASE.

CASE VI.—E., a gentleman about forty years of age, was admitted into the City of Dublin Hospital under my care in October, 1885. He gave the following history:—

" Whilst in India, 14 years since, a Buggy wheel went over my left foot, which discoloured the instep and caused me to be lame for a short time. Again, about five years since, the same foot was a second time run over, which in no way inconvenienced me for about three years. It then pained me on walking much,

and eventually became swollen, and a sinus formed last March two years, which was cured in about two months. On using the foot again the ankle became much swollen and painful. I was then directed to give it rest and apply cold lotions. The foot did not improve, but became more painful, with constant twitching Then for a long time I applied hot stupes with no good results, blisters were applied, and eventually iodine. Not having improved, I went by advice to China for change of air. Having returned from China, it was found that an abscess had formed, which was lanced. I remained in Calcutta for ten days, and was told that the bone was not diseased, and that I might return to my district. It had, however, soon to be lanced again, which was repeated on several occasions. Before leaving Calcutta a large quantity of the flesh which was between the sinuses on the inside of my ankle was removed. During the voyage another abscess which formed on the outside of my ankle had to be lanced. When I arrived in London I went to St. Thomas's Hospital, where Mr. —— was of opinion that the bones were not implicated. He repeatedly lanced and scraped the sinuses, also giving medicine internally, and he was of opinion, from the way I progressed, that I would be quite well in two months. I attended at St. Thomas's Hospital for a little over three months, and then left for Dublin, October, 1885. On arrival I had an attack of ague, which I had never suffered from in India."

On examining this patient in the City of Dublin Hospital there was not any difficulty in discovering that his os calcis was extensively diseased. Four sinuses led down to diseased bone. In a few days after I passed a probe into the inferior sinus, which penetrated the astragalus. The motions of his ankle-joint were not impaired, and pressure of the astragalus against the tibia did not cause him any pain whatever.

Having fully explained to the patient the nature and extent of the disease, I told him of the operation I proposed to perform. It was a great matter to him to have the anterior portion of his foot sound, as it would enable him to ride on his return to India. Formerly an indigo planter, now the manager of an indigo plantation, it was a matter of the utmost importance that he should as speedily as possible return to his business. I was obliged, how-

ever, to delay the operation for a while on account of his attack of ague.

The operation was performed in this way :—A semilunar incision was made, such as I have described for removal of the os calcis, keeping, however, a little higher up at the posterior surface, and dissecting the flap forward. The calcaneo-cuboid articulation was next opened and the ligaments of the ankle-joints divided; the astragalus and calcis now separated, so I removed the latter bone and afterwards the astragalus. Having seized it with a lion forceps I forcibly brought it forwards and opened its articulation with the scaphoid bone. I next removed the malleoli, and with the internal the articular surface of the tibia. The flap was now adjusted and placed in position, but not pressed firmly. The lines of incision healed slowly. He was not discharged from hospital until April last, when he could bear a tolerable amount of pressure over the seat of operation. The bones which you now see show carious disease. The inner malleolus was rough, and the articular surface of the tibia congested and ecchymosed. The cast which represents the foot after operation was taken in August last, at which time he was able to wear a properly-adapted boot and walk fairly well, with the assistance of a stick. I received a letter from this gentleman from Malta, dated 1st of last month, in which he gave me the most favourable report of his locomotive progress. The lithograph, taken from cast, admirably shows the condition of the foot after operation.

I shall not recount in detail any of the other operations that I have successfully performed on the foot—as Syme, Hey, and Pirogoff—but may add that I have removed the cuboid bone twice, the scaphoid once, the middle cuneiform once, several times the metatarsal bones, and I have once resected the first phalango-meta-tarsal articulation. The results of these operations were satis-factory. It may not be uninteresting to review briefly some of the operations I have brought before this Section.

The first excision of the os calcis appears to have been performed by M. Robert, in 1837; and the first in England by Greenhow, about ten years later. I shall not discuss the advantages claimed

for the various incisions recommended for the removal of the
entire os calcis. Such can be found in the various works on
surgery. I prefer the method which I have recorded, which is
very similar to that mentioned by Erichsen, except that I do not
make the perpendicular incision, and consequently have only the
one flap—horse-shoe in shape. In making the external incision
the operator should be careful not to divide the tendon of the
peroneus longus as it passes through the groove in the cuboid
bone. Many surgeons have condemned this operation; the late
Sir William Fergusson said he never found it necessary to perform
such an operation; Syme and Lisfranc also disapproved of it; others
urge that on account of the large size of the bone—the important
part that it takes in support—that its complete or even partial
extirpation should be delayed as long as possible. This latter
statement, indeed, appears to me to be erratic in principle, and to
be one of the many reasons why the removal of the calcis may
subsequently be followed by disease in other bones. I must not
be understood as advocating excision of this bone without due
and careful deliberation, but I wish emphatically to express my
disapproval of any half-measures when disease is evident, and
established statistics declare that it is a favourable operation,
and affords results that could scarcely be anticipated. Dissection
has proved that dense tissue occupies the former situation of the
bone into which the tendo-Achillis is inserted, and the short
flexor muscle of the toes, together with the abductor pollicis and
minimi digiti, lose themselves. The cuboid bone inclines back-
wards towards the astragalus, to which it is frequently united by
fibrous bands.

Complete excision of the astragalus for displacement is undoubt-
edly of ancient origin, but for disease is of comparatively recent
date. In England up to 1864 only three cases of complete removal
for disease have been recorded. Assuredly, if there should not be
undue delay in removal of the os calcis, greater expedition is called
for when disease occurs in the astragalus. Experience has shown
that amongst all the bones of the tarsus it takes a foremost place
in rapid implication of adjoining osseous structures. The surgeon

will act well to his patient who advises early removal of the astra-
galus when diseased. This operation, according to the most recent
statistics, is very favourable. Mr. Hancock gives 109 cases of
complete excision of the astragalus for compound dislocation,
simple dislocation, and disease, out of which number 76 recovered,
15 died—a death-rate of 14·6 per cent. Of the 10 cases quoted
by Hancock operated on for disease, 6 recovered with good and
useful limbs, 1 underwent secondary amputation and recovered, 1
died, in 2 the result is not stated. Mr. Gant records 14 cases
of complete excision of the astragalus for disease. Of these, 9
recovered, 2 underwent secondary amputation and recovered, in 2
the result was not reported, and 1 died. Excision of this bone
appears to have been first performed in 1582 by a surgeon of
Duisburg for accident.

Those cases that demand excision from displacement, the result
of injury, must be carefully distinguished from cases of apparent
dislocation, the result of hysterical contraction. In the latter
class of cases, from the continual contraction of the muscles, the
bone becomes much more prominent, owing to the laxity of the
ligaments produced by constant tension. Mistakes of this kind
can be easily obviated by observing the conditions of the parts
during sleep (considering also the age and sex of the patient) or
under the influence of an anæsthetic. An astragalus apparently
displaced to such an extent that the patient walked on the external
surface of her foot, will probably be recalled to the memory of
some here present, in which excision of the astragalus was not
only contemplated, but about to be performed, on an hospital
patient, when the resident staff observed that during sleep the
displacement disappeared. In removal of the astragalus I did not
find it necessary to saw the bone at the neck and leave the head
articulating with the scaphoid, to be afterwards removed. This
procedure is advised by some surgeons, but is unnecessary.

With respect to contraction after Chopart's operation, I may
state that experience and dissection have shown that it is not only
the tendo-Achillis that may be at fault, but the flexor communis,
the tibialis posticus, and the long flexor pollicis. Hence, the want

of success in relieving the contraction by the division of the tendo-Achillis. Out of the three medio-tarsal operations I have performed, I have been fortunate not to have had any contraction. In one case only did I secure the tibialis anticus and peroneus longus to the site of the cicatrix. I doubt not that if the ankle-joint is kept well flexed during the process of cure that no contraction will take place; but to me it seems that the removal of the scaphoid bone plays an important part in the cause of this contraction—an additional reason in favour of those who argue that if a bone of the foot be not diseased or implicated it should not be removed because it may happen to form the line of a particular operation.

In the last case that I have recorded—the removal of the os calcis, astragalus, and external and internal malleoli with the articulating surface of the tibia—I find in the *Lancet* of 1848 not altogether a dissimilar case recorded by Mr. Thomas Wakley, entitled "Excision of the Ankle-joint and the entire Removal of the Astragalus and Os Calcis." His incisions, however, are most complicated, and he removed a flap from the sole of the foot situated between two of the incisions made for the purpose of forming his flaps. The posterior tibial artery was cut, and the anterior tibial vessel narrowly escaped. The mode of procedure adopted by Mr. Wakley is complicated and unnecessary.

Heyfelder reports removal of the os calcis and astragalus in 1858 by a much less complicated method than that of Mr. Wakley—the second case on record. Many examples of advantageous and successful removal of the bones of the tarsus are related by Mr. Holmes in his "System of Surgery;" by Annandale in the *Edinburgh Surgical Journal* and in *St. George's Hospital Reports*; and one case is recorded in the *Lancet* of 1881, where it is stated that the entire tarsus was removed, no tendons were cut, the periosteum was preserved, and the tissues were replaced by a solid mass.

I am not aware of any successful case of the removal of os calcis and astragalus in Dublin until the one I have just reported.

In conclusion, I hope that I may state that before deciding on any particular operation it will be well to consider in what stage the disease is—whether acute or chronic—progressive or quiet,

diffuse or limited. It is in the chronic and non-diffused cases that partial operation is successful; when diffused and in large articulations partial operations are worse than useless. Again, caries following on inflammation of ligaments is much more favourable for partial excisions than when caries commences in the cancelli of the bones.

A CASE OF TREPHINING OF THE MASTOID PROCESS FOR INFLAMMATION EXTENDING FROM THE INTERNAL EAR TO THE SINUSES AND MEMBRANES OF THE BRAIN, CAUSING DEPRESSION, APHASIA, AND PARALYSIS, FOLLOWED BY COMPLETE RECOVERY.

By HENRY FITZGIBBON, M.D., F.R.C.S.;

Vice-President of the Royal College of Surgeons of Ireland ;
Surgeon to the City of Dublin Hospital and Government Lock Hospital.

Miss A. E., a lady aged twenty-seven years, who had never suffered from any illness, with the exception of scarlatina, which she had very severely in childhood, and after which she suffered for some time from ear-ache, was attacked in the month of April, 1886, by what was described to me as an abscess in the ear. She suffered much pain for several weeks, and was greatly pulled down by consequent loss of sleep, but for a while appeared to get better, towards the end of the month of May.

I was first consulted about her upon the second of June, owing to a sort of depression having taken hold of her, which made her family very uneasy. As she resided in a remote part of Ireland, I was consulted by letter, but from the history of her illness and the description of the state of depression into which she had fallen, I expressed my opinion that her condition was very alarming.

Dr. Mayne, of Longford, under whose care she was, fearing that some affection of the brain was coming on, held a consultation, upon the 4th of June, with Dr. Blakeney, of Roscommon, when they agreed in thinking that her brain was not affected.

The discharge from her ear appears to have ceased altogether

about this time, and she became so depressed, and her speech at times so confused, that, her family being seriously alarmed, I was summoned to see her on the 5th of June.

I found her dressed and sitting up, being so restless that she could not be confined to bed. She had lost flesh to such a degree that she resembled one in advanced phthisis. Her face was paralysed on the right side—anxious, careworn, and expressive of long-continued suffering; the lips parched and cracked; the tongue, which was protruded to one side, was coated with aphthous-like patches; her skin harsh and dry, and her hands hard and withered; pulse weak and rapid, varying from 120 to 140; temperature rather sub-normal. Her face was distorted by complete paralysis of the muscles of expression upon the right side. She articulated with difficulty, but her power of speech varied considerably, being at times much better than at others. She had no delusions, but frequently called people by wrong names, and said the opposite of what she intended, and often became confused and unable to express what she wished, which irritated and annoyed her greatly. She complained of pain over the left parietal region, and a sensation of distressing cold over that side of the face and head. I ascertained that she had been paralysed upon the left side of the face from about the 1st up to the 27th of May, upon which day she had taken an unusually long drive, from which date the serious cerebral symptoms commenced, the facial paralysis changing from the left side to the right. She had some loss of power in the lower extremities, dragging the right leg more than the left.

On examining the left ear I found the upper part of the membrana tympani occupied by some pale, unhealthy granulations, which were coated with a cream-like exudation. I believe these granulations marked the site of a perforation of the membrane, which they had overgrown and closed. The membrana tympani of the right ear was quite healthy. There was no swelling or œdema over the mastoid process, or expansion of the bone, to indicate extensive disease of its cells, but there was decidedly some tenderness upon pressure. Her hearing with the affected ear was imperfect as compared to the other, but on the whole she was

rather morbidly acute as to sounds, but noise did not distress or give her pain.

I expressed it as my opinion that she was suffering from inflammation extending from the internal ear to the membranes and sinuses of the brain, and that probably some intra-cranial suppuration had taken place. I could see no prospect of her recovery unless relief could be given by trephining the cranium. I therefore proposed to perform the operation, as I believed it would afford her a chance which should not be denied to her. Dr. Mayne was strongly of opinion that it would not only be followed by no beneficial result, but that it would hasten a fatal termination of her illness. He also thought that some improvement had taken place within the previous forty-eight hours, and her family were under the same impression. He attributed this change for the better to the fact that she had been taking iodide of potassium during that period, which she had not taken previously to his consultation with Dr. Blakeney.

I returned to Dublin the following morning, without having operated, as her friends preferred to give the treatment by the iodide a trial before consenting to so serious a proceeding upon my unsupported opinion. I was but one day in Dublin when I was recalled, her symptoms having become more alarming. I was requested, if I still thought an operation advisable, to bring any other surgeon I wished with me. I returned, accompanied by Mr. Wheeler, upon whom my choice naturally fell, as I had assisted him at three operations, in which he trephined successfully for mastoid and tympanic disease.

We found the lady in no respect improved since my last visit, but decidedly much weaker and more depressed. Those in attendance upon her had observed the loss of power over her lower limbs to have increased. There was, however, no marked paralysis of either sensation or motion, except that of the face, which I have already described, and which was complete upon the side opposite to the affected ear. Having carefully examined her, and considered every aspect of her case, with Dr. Mayne, who was in attendance to meet us, Mr. Wheeler and I were fully satisfied that

a fatal termination to her illness was not far distant; yet we were of opinion that trephining the mastoid process would afford her a chance which she ought not to be denied. The patient having been put under the influence of ether by Dr. Mayne, I made a vertical incision about two inches long close to the back of the ear. I then made a transverse one, extending from the centre of the first incision posteriorly across the mastoid prominence, and reflected the flaps, so as to expose the bone freely. Having divided and pushed aside the periosteum, I applied an ordinary hand trephine, $\frac{5}{8}$ of an inch in diameter, to the bone, taking care that the inferior margin of the trephine was a little above the level of the external auditory meatus, the posterior margin of the circle touching a vertical line dividing the mastoid process. The instrument soon cut through the entire substance of the bone for the upper two-thirds of its circumference, but the lower third remained firmly fixed. Having ascertained with a quill that I had penetrated as deeply as I could safely go with the trephine, and that the upper two-thirds of the circle was freely cut through, I applied an elevator to detach the lower third, which I succeeded in doing, but as the button came out another piece of bone became detached along with it, which I picked out of the wound with a forceps. A little venous oozing took place into the cavity, but was easily arrested. The dura mater was exposed, but no pus appeared. I dressed the wound with a drainage-tube to the bottom, and a shred of wet lint inserted alongside of it, both to act as a wick and to retain it *in situ.* Hot flannel fomentations were applied, and frequently changed during the night.

The next day she was more prostrate and restless than before the operation. I continued to dress the wound in the same manner, and had the hot fomentations kept up. I observed that there was slight bloody discharge from the ear, but in syringing it none of the lotion passed through into the operation wound.

There was no change in her condition for the first four days after the operation; her pulse remained rapid and weak; she was restless, irritable, and took her nourishment unwillingly and with difficulty. It is remarkable, however, that her temperature never

rose above 99°. On the 4th day after the operation pus appeared in the wound, which was still carefully dressed from the bottom with a tube. It was difficult to be certain whether this pus came from the mastoid cells, from within the cranium, or only from the surface wound. I was obliged to return to Dublin, and did not again see her until the 19th. In the interval she had been attended by Dr. Mayne, under whose supervision the wound was dressed in the same manner as I have described.

There was now a good deal of purulent discharge, and I satisfied myself beyond doubt that it came from the opening in the bone. She appeared to suffer little pain in the head now, as compared with what she complained of before the operation, but there was yet no improvement in her general condition; she was restless, wandering, and incoherent, and she appeared to be losing strength so much that I confess I had now little, if any, hope of her recovery.

I again returned to Dublin, leaving directions that the operation wound should be dressed thrice daily in such a manner as to facilitate as much as possible the free exit of the discharge. One day no discharge came through the tube, and she was very bad that night—almost violent; next day it came more freely, and she got very much better, quite calm, and had the best night since the operation. It again stopped on June the 25th, and she had a very bad night of restlessness and raving, in consequence of which I was asked to go down to see her, in the hope that I might be able to do something to free the escape of the matter, which was evidently becoming pent up in some way. I did so the next day, and found the opening through the bone choked up with soft, unhealthy-looking granulations, which prevented the drainage-tube from going beyond them. I scraped them out with the spoon of a director and replaced the tube to the bottom of the opening through the bone. Her progress towards recovery from this was slow and varied, but progressive. During convalescence she became possessed of many delusions. By degrees, as she grew stronger, these disappeared and convalescence was established in a few weeks, and her restoration to health, both of mind and body, perfect. There

remains no trace of the facial paralysis, and she has in every respect regained her former robust health.

The portion of bone which came away with the elevator, in removing the button cut by the trephine, proved on examination to be a portion of the upper surface of the petrous portion of the temporal bone. Professor Cunningham kindly examined the fragment and verified this fact. This has a practical bearing upon the selection of the exact position to place the lower margin of the circle of the trephine. I believe I placed it a little above the position generally supposed to clear the great lateral sinus; yet had I been in the least lower down I believe that so much of the circle would have been involved in the petrous portion of the bone, that it would have been very difficult, and fraught with considerably greater danger in breaking out the segment, of lacerating of the lateral sinus.

PYLORUS RESECTION.

By J. S. M'ARDLE, F.R.C.S.;
Lecturer on Surgery, St. Vincent's Hospital, Dublin.

[Read in the Surgical Section, February 18, 1887.]

As evidence of the importance of this question of pylorectomy, I desire to call attention to the following figures, which show how frequently cancer of the stomach is confined to the pyloric end :—

Habershon collected 79 cases of cancer of the stomach, and of these 41 were of the pylorus, 11 of the lesser curvature, and 10 of the cardiac end ; the remainder being examples of diffuse carcinoma. Brunton collected 360 cases—219 of the pylorus, 38 of the lesser curvature, and 36 of the cardiac end. The greater curve, anterior and posterior surfaces, each were attacked in 11 instances, while in the others the disease was widespread. Gussenbaur and Winiwarter examined, in the Pathological Institute of Vienna, 903 cases, and of these 542 were of the pylorus, 65 of the lesser curvature, and 58 of the cardiac end ; in the remainder the disease appeared as scattered nodules, or as a general implication of the stomach.

Thus we see that in more than 50 per cent. of all the cases of cancer of the stomach the disease was confined to the pylorus. Of this number more than half will come within reach of surgical aid, for, as shown by Gussenbaur and Winiwarter, of 542 cases of cancer of the pylorus, only 252 were complicated by enlargement of glands, infiltration of neighbouring tissues, or adhesion of the tumour to adjoining viscera. Thus, one-fourth of all the cases of cancer of the stomach would come within our reach. Habershon remarks that patients affected with cancer of the pylorus die within one year of the appearance of the tumour. Many instances are now recorded of patients living four and five years after resec-

tion of the pylorus for cancer. Now, if the removal of the diseased
structure will relieve the misery and prolong the life of our patients,
we must look upon pylorectomy not only as a justifiable but as a
necessary operation. It may be argued that a return of the cancer
is certain, but Winiwarter has shown that the recurrence is not as
frequent or as rapid as after removal of the breast for cancer, and
permanent healing is not less frequent. Even should we expect
an early recurrence we may console ourselves by the knowledge
that however soon the disease reappears it never leads to obstruc-
tion, or indeed to marked intestinal trouble of any kind.

The operations proposed for the relief of stricture of the pylorus,
whether simple or malignant, are—Jejunostomy, as conducted by
Surmay and Langenbuch; gastro-enterostomy, as performed by
Wölfler; digital dilatation, as described by Loreta; pylorectomy,
first performed in the human subject by Péan; and the combina-
tion of gastro-enterostomy and pyloric resection, introduced by
Billroth.

The results of jejunostomy have up to the present been very
discouraging, and even though life may be occasionally prolonged
by its performance, the great inconvenience of an intestinal fistula
and the merely temporary benefit derived will deter most surgeons
from undertaking this operation, unless in cases of extensive infil-
tration, in which removal cannot be accomplished.

Gastro-enterostomy has the fatal objection that, while being a
dangerous and tedious operation, the cancer is left to kill the
patient just as rapidly as if no treatment had been adopted. Of
the eight cases conducted in Billroth's Klinik five died as a result
of the operation; of the others one died in a month, another in two
months, the third in the fourth month after operation. This is
a sufficiently bad record to deter one from operating after this
fashion.

Digital dilatation, as proposed by Loreta, has been carried out
in 12 cases, with four deaths as the result of the operation. One
of the remaining 8 is said to have been alive and well six months
after the operation; the others seem to have been lost sight of.
Of course this operation is suited only to simple stricture, as any

breaking down of cancerous tissue in such a vascular neighbour-
hood would only lead to rapid development.

Billroth's complex operation has as yet succeeded only in one
instance, and the case was in every way a favourable one. In bad
cases the operation must be so protracted that recovery can hardly
take place if the patient be at all broken down. This leaves pylo-
rectomy as the only hope for cancer, and (as we shall see later) the
most reliable means of treating simple stricture.

The case which excited my interest in this subject is briefly as
follows :—

CASE.—J. O'N., aged forty-six years, was admitted into St.
Vincent's Hospital on May 31st, 1886, under the care of Dr. Cox,
who handed him over to me for operation, which I performed after
Billroth's method on the 18th June, 1886, making, however, a
vertical instead of a horizontal incision through the abdominal
wall. The tumour measured $2\frac{1}{2}$ inches along its upper and 2 inches
along its lower border. I applied the duodenum to the greater
curvature, using a double row of catgut sutures. The operation
lasted nearly three hours, and during that time small nutrient
enemata were administered, and we found it necessary to give him
hypodermics of ether. The patient was removed to bed, and
although he rallied somewhat, he died from exhaustion four hours
after operation. The *post mortem* showed that all traces of the
disease had been removed, and on taking out the stomach and
duodenum the lines of incision were marked by a gelatinous
material covering the sutures. On distending the stomach with
water, no escape took place, showing that accurate apposition had
been brought about.

The failure here evidently resulted from the exhaustion pro-
duced by the prolonged operation on an individual so worn out by
inanition. To ascertain the method which diminishes the length
without influencing the completeness of the operation was my first
object in collecting and reviewing all the published cases of pylo-
rectomy.

In looking over the field of gastric surgery one is struck by its
narrow limits, and in a marked way is reminded of the early days
of ovariotomy. On the very threshold of the inquiry the question

arises—Why the ill success of this operation? To my mind the answer is the one given to a similar query in reference to the early and even some of the late ovariotomies—viz., that the cases operated upon were unsuitable, or the details of the operations were ill understood.

So much depends on carrying out the many details, and so few have anything like an extensive personal experience of it, we must collect and study the views of the various workers in this field, in order that, learning from them the difficulties which attend almost every step of the procedure, we may be prepared to overcome them. Morris, in Ashhurst's "Encyclopædia of Surgery," says:— "As yet the surgical mind is not settled as to the conditions for which the operation should be performed, or as to the precise steps of the operation." The instances of pyloric resection are now sufficiently numerous to allow of some effort being made in both directions. My reference to the subject would therefore naturally be divided into two parts—first, from the cases which I have collected to ascertain the characters of those which have been successfully operated upon; and, second, to examine into the influence of the different operative procedures on the results obtained.

The records within my reach, including all the original communications of those who have advanced this subject, yield, after careful perusal, 70 cases of complete pylorectomy. Of these 8 were on account of simple stricture, 62 for cancerous disease. Of the cases conducted for simple stricture, 5 are recorded by Rydygier, and of these 4 were completely successful; the fifth died on the seventh day. Of the 3 recorded by Hacker, 1 died in 14 hours, another on the seventh day, the third completely recovered. Of the 62 cases operated on for cancer, 21 died as a result of the operation; 14 from peritonitis or septic absorption; the remaining 27 made good recoveries, many of them being reported well four years after operation. Thus 35 of the 62 cases of cancer died, while only 3 of the 8 cases of simple stricture succumbed. The markedly high mortality of the former class becomes at once apparent, and in seeking its cause we learn the conditions which contra-indicate the operation.

In the 21 cases in which death occurred within 24 hours of the operation, the patients were already worn out by disease, and the tumour was in each case attached to important viscera. In the 14 cases in which death occurred within 14 days of the operation, adhesions were extensive, but the patients were not so exhausted; and in the 27 cases of recovery we find that adhesions were absent or very slight, few of the operations lasting more than one hour and a half. Turning to the cases undertaken for simple stricture, we learn that death occurred only in those cases in which adhesions were present in a marked extent. So important is this question of adhesions that Hacker divides his cases into three classes—those having no adhesions, those having slight adhesions, and those having extensive adhesions—and of 15 cases of cancerous stricture operated upon in Billroth's Klinik, 2 were of the first class, and no death occurred; 8 were of the second class, with 3 deaths; 5 of the third, with 5 deaths; and so it is through the list of cases I have collected. When adhesions were absent recovery took place, but in no case, where adhesions were extensive, did the patient live more than a few days.

A question of great importance arises in reference to these adhesions—Where do they most frequently occur? The statistics published by Gussenbaur and Winiwarter show that in 252 cases in which adhesions were present the tumour was attached in 116 instances to the pancreas, in 71 to the omentum, in 65 to the transverse colon. In the 37 cases which I have collected, the tumour adhered to the pancreas in 16, to the great omentum in 9, to the transverse colon in 7, the liver in 4, the small intestine in 1.

Thus we learn that the pancreas is the most frequent point of attachment of the tumour. Now, if the adhesions are here broken down, the secretions of the gland pour through the lacerated part and digest the wound-border. The omentum comes next in frequency as the point of attachment, and although separation from the omentum would not be of much consequence, it is found that when the tumour adheres to the great omentum there is usually a considerable amount of infiltration along the greater curvature, and a frequent result of operation under these circum-

stances is a sloughing of the wound-border, and, of course, death. Next comes the transverse colon, and, if the adhesions be extensive, removal of the tumour is followed by gangrene of the colon. So certain is this to occur that Lauenstein and Czerny have recommended resection of that portion of the colon to which the tumour adheres. This is, undoubtedly, a wise proceeding, not only on account of the danger of gangrene, but on account of the great delay occasioned by separating the parts. I have called attention to these definite points of attachment as landmarks for our guidance in digital exploration of the abdomen.

Since the chief causes of the high mortality after this operation are, first—the presence of extensive adhesions; second, exhaustion from long-standing disease—we may look upon the following as the conditions under which the operation is likely to prove successful:—

1st—In irritable and intractable pyloric ulcer leading to spasmodic stricture.

2nd—Simple fibrous stricture.

3rd—Circumscribed cancer without adhesions, and before exhaustion has occurred.

It may be asked how we are to determine the presence of these conditions, and the answer is that such as are not readily made out by ordinary diagnostic methods are ascertained by making a digital exploration of the pyloric district—an operation which, conducted with ordinary care and through a limited wound, is devoid of danger, and yields invaluable information.

We now come to the study of the operative procedures carried out with the object of removing the pylorus, and we find that there are modifications numerous as the operators, but for all practical purposes we may confine ourselves to the chief points of difference in carrying out the following steps of the operation:—First, section of abdominal wall; second, detaching the tumour from the omenta; third, cutting through the stomach and duodenum; fourth, suturing the duodenum to the remains of the stomach.

Section of the abdominal wall is made by Czerny in the linea alba above the umbilicus. He claims for it the advantage of

being a bloodless operation, but it has the serious objection of necessitating dangerous traction on the descending duodenum, and in my case I found it quite impossible to complete the removal of the tumour without making a transverse incision near the upper end of the vertical one.   The delay occasioned by endeavouring to work through a central wound is also considerable, and is a fatal objection to this method.

Rydygier makes a vertical incision two fingers' breadth to the right of the linea alba.   This allows free access to the neighbour-hood of the descending duodenum, and owing to the mobility of the stomach the line of incision of that organ can readily be brought to the abdominal wound.

Billroth and Wölfler make a transverse incision across the tumour, usually some inches above the umbilicus.   This allows the operation to be completed without undue traction on any part of the intestine or stomach, and the ready access which it gives to the diseased area hastens the operation so much that the slight delay occasioned by checking hæmorrhage from the abdominal wall may be overlooked.

Hagen Torn cuts through the muscular wall of the abdomen, so that the resulting cicatrix may be firm and hernia prevented.

An incision parallel to the lower border of the thorax has been recommended, but it is not to be compared with the transverse, or even with Rydygier's incision.

In reference to the separation of the tumour from the omenta there are two points of importance—first, the danger of removing too much of the omentum, or of making the section too close to the intestine ; second, the delay caused by this step of the operation. If the omentum be cut more than a few lines beyond the line of incision through the stomach, there is, as shown by Rydygier, danger of sloughing of the wound-border, while section close to the intestine causes, as noted by Czerny, gangrene of that portion from which it has been removed.   The delay occasioned by ligaturing the omental vessels separately is quite unnecessary, as a consider-able number can be safely occluded by passing under them a blunt and pliable aneurysm needle loaded with a double catgut ligature.

When adhesions are present, their separation is the most tedious part of the operation ; and Czerny holds that in simple stricture we should, in removing the tumour, leave the serous coat of the stomach attached to the viscera in order to shorten the operation, and this especially when the pancreas or colon comes in question.

The next step in the operation—section of the stomach and duodenum—is of some importance, and in reference to it we must decide three questions :—First, How are we to deal with the contents of the stomach and duodenum during section? second, In what direction should section be made? and third, How is section to be made?

The contents of the stomach and duodenum must be kept from pouring into the abdominal cavity during section, and for this purpose Rydygier uses elastic compresses, Gussenbaur employs a clamp or forceps, while Schede, Billroth, and others, apply a loop of silk, a piece of elastic drainage tube, or a strip of iodoform gauze round the duodenum, the stomach being compressed by the hands of an assistant. Modifications of the instruments used by Treves, of London, and Bishop, of Manchester, in intestinal resection, can be employed in pylorectomy. There are two objections to Rydygier's methods, and they apply to Gussenbaur's also—first, the compresses or forceps impede the laying on of the posterior sutures; and second, they compress the vessels, so that points which will bleed some hours after their removal are for the moment stopped, and ligatures cannot be applied. Manual compression is no doubt the best, but before operation the stomach should be thoroughly irrigated, and after section it should be sponged out, and a small sponge should be passed into the orifice of the duodenum. During section a soft flat sponge is placed behind the tumour.

The line of incision of the stomach is of such importance that I must call attention to the accompanying diagrams, which show the different lines of section and the manner of applying the duodenum to the remains of the stomach. Figs. 1 and 2 show the stomach before and after vertical section and the removal of a V-shaped piece from the greater curvature, the duodenum being
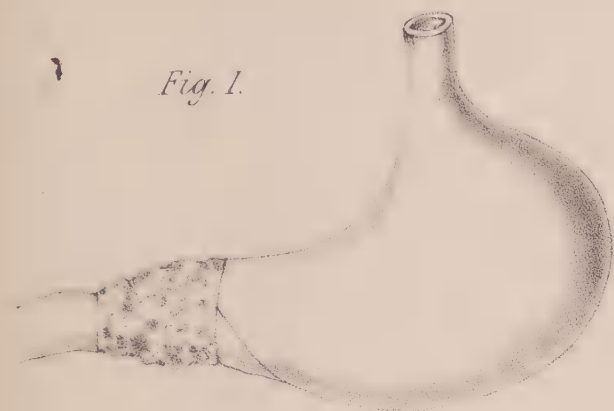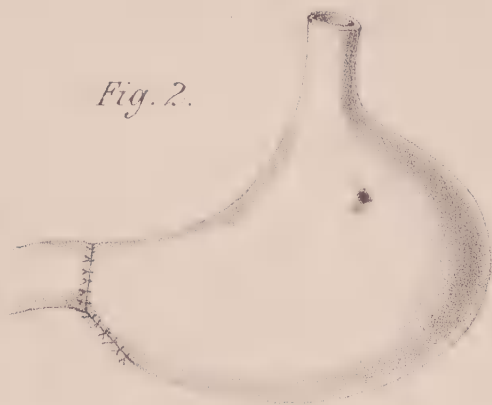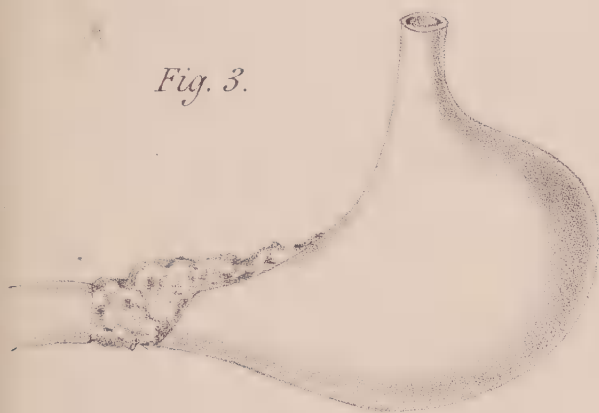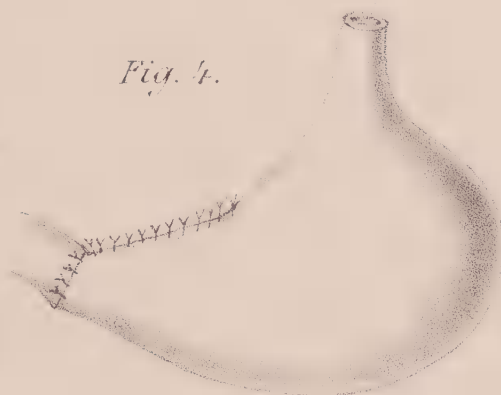
Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

F. Huth, Lith.r Edin.r

Mr. Mc Ardle on resection of the Pylorus.

Fig. 7.

Fig. 8.

c

a

b

d

Fig. 9.

Fig 10.

Fig. 11.

Fig. 12.

F. Huth, Lith. Edin.

Mr. Mc Ardle on resection of the Pylorus.
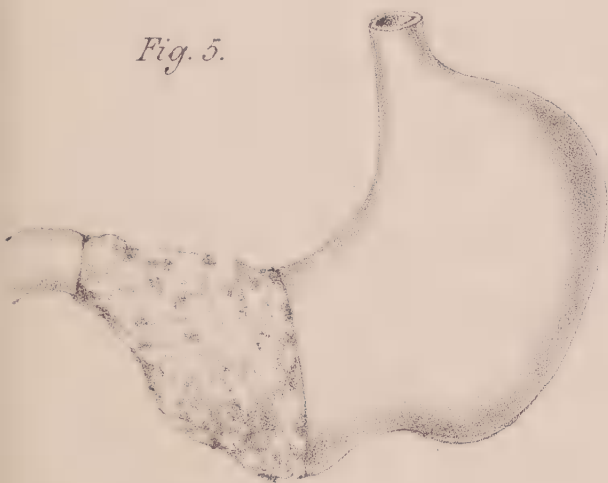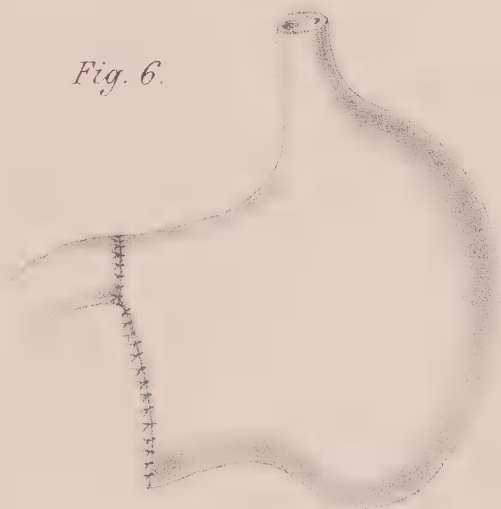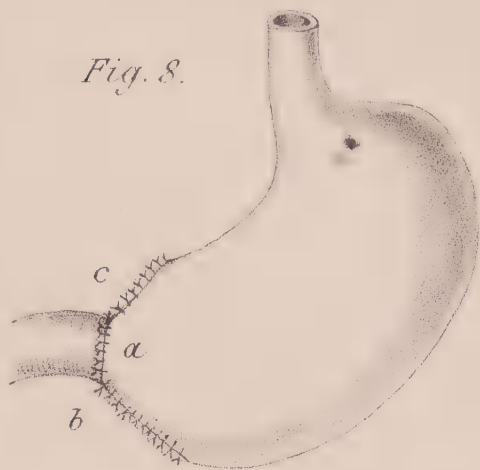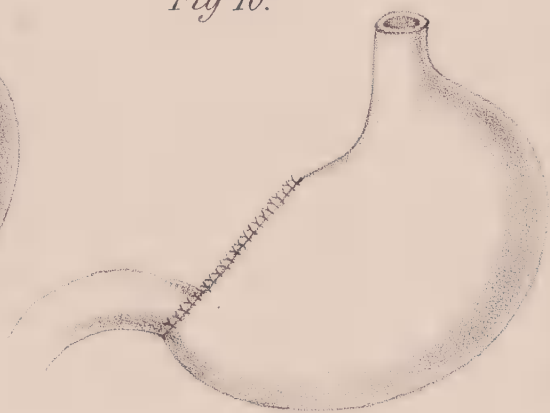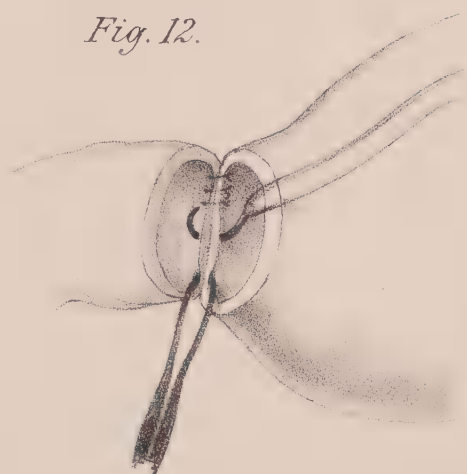
applied to the lesser curve. This was first done by Rydygier and afterwards by Billroth. Figs. 3 and 4 represent a much better method, in which a cancer extending along the lesser curve was removed by an angular incision, the duodenum being attached to the greater curve. Figs. 5 and 6 show the worst possible incision— vertical, with application of duodenum to the lesser curvature. In the case in which Billroth carried out this method a large pouch formed, owing to the collection of food in the lower angle of the wound, and led to fatal peritonitis. Figs. 7 and 8 show the result of another case of Billroth's, and the incision is not to be recommended, since at the joining of the duodenum to the central vertical part (marked a in the diagram) it is difficult to close accurately the points (b and c). On the whole, the section as shown in Figs. 9, 10, and 11 will be found to answer best in most cases. Fig. 9 represents the lines of incision; Fig. 10 the state of things immediately after operation; Fig. 11 the condition of the stomach when removed from my patient sixteen hours after operation. This method of oblique section, applying the duodenum to the greater curve, is the one now most frequently adopted by Billroth, Wölfler, Rydygier, and others.

The stomach and duodenum may be cut through by cautery, knife, or scissors. The cautery, I believe, produces very severe shock, and I think peritonitis would be very likely to follow its use. In my case collapse occurred immediately on passing the cautery through part of the stomach wall. The knife is slow, and in an operation in which rapidity is of such moment, any means of hastening it should be sought. The scissors seem to me to answer admirably, and I have used them in intestinal resection with great comfort to myself. Rydygier has recommended a very long-bladed, probe-pointed scissors for the purpose, and they will be found very useful.

We next come to the suturing of the viscera, and it is well to bear in mind that the duodenum should be applied so that no pouch exist such as the one depicted in Fig. 6. If the cancer engages the greater curvature, an oblique section, leaving the most prominent part of the stomach at the lesser curve and applying

the duodenum there, will be admissible. The materials used are carbolised silk (Czerny, Billroth) and catgut (Rydygier). Whichever substance we use, great care must be taken to avoid too tight an application of the sutures, as in many of the recorded cases they have rapidly ulcerated through and set up peritonitis. A continuous suture should not be applied, as sloughing of the wound-border has followed its use. On the whole, the double suture recommended by Czerny seems best, the deep or mucous stitches for the posterior wall being applied first, and from the inside, as depicted in Fig. 12, then along the anterior wall, the second row being placed somewhat further apart. In the narrowing down of the gastric opening to the size of the duodenal, and in applying the viscera together, at least fifty sutures will be necessary.

It is needless to discuss the remaining steps of the operation. I have indicated the methods which seem to hasten it, I have shown the cases unsuited for it, and I conclude by saying that if—before the steps of the operation are well understood and before the conditions which indicate it are fully known—47 per cent. of cancerous and from 70 to 80 per cent. of non-cancerous succeed, what may we not expect when we are fully aware of the conditions under which the operation is likely to prove successful, and when every step is conducted with precision. If the cases be selected, and if the details be carried out with rapidity and care, I believe the operation will yet rank as one of the greatest surgical triumphs of this or any other age.

ŒSOPHAGOTOMY TO REMOVE A FOREIGN BODY.

By J. K. BARTON, M.D., F.R.C.S.;

Surgeon to the Adelaide Hospital.

ŒSOPHAGOTOMY for the removal of a foreign body impacted in the pharynx or œsophagus is now accepted amongst surgeons not only as a justifiable proceeding, but as a safe one. Aitken gives a table of 36 cases of œsophagotomy, 32 of which were for the removal of foreign bodies. Of the whole number 27 recovered, but as 2 were for carcinoma, we may say that of 34, 27 recovered. This is a percentage which may fairly encourage those who look upon the operation as an exceptionally dangerous one, and the cases operated on by Mr. Wheeler, and recorded before this Section, while widely differing as to the cause which necessitated the operation, yet all support the conclusion that the proceeding itself is not exceptionally dangerous. There seem to be several reasons which have combined to make surgeons, otherwise bold, timid about this operation :—1st, no doubt, the important parts which lie in the line of incision ; 2ndly, very little experience could be obtained by any one surgeon, as these cases are rare ; but, 3rdly, more than all, was, I am persuaded, the delusive expectation that a foreign body fixed in the pharynx or œsophagus will be easily removed through the mouth. The sensation conveyed by touching the foreign body with a probang, or long curved forceps, is delusive to a great degree—feeling it so distinctly and so movable, as it will to a certain extent be found, we naturally conclude that its extraction will not be a difficult matter. Experience proves that this is much harder to accomplish than appears at first sight, and that in a large proportion of cases it is impossible to withdraw it *safely* through the upper outlet of the gullet. The sense of mobility conveyed to

the hand is deceptive, because the soft tissues in which the foreign body is impacted move with it, to a certain extent, when it is grasped.

For these reasons it happens that cases of foreign bodies impacted in the œsophagus (or very usually at the junction of the pharynx with the œsophagus) are frequently allowed to remain a long time before the operation is resorted to. This seems to me unfortunate, and one use of the record of such cases as the one I am about to read is, that surgeons may come to look at œsophagotomy not as a last resource—as the operation for strangulated hernia used to be deemed—but as a proceeding which should be resorted to as soon as a fair trial had been made, without success, of other and milder measures. Now the reasons which have led to a great and salutary change in the surgical practice of strangulated hernia are precisely those which may with truth and equal force be urged in the practice of œsophagotomy, and these are :—1st, the insufficiency, as a rule, of non-operative means; and, 2ndly, the very serious effects and dangers of leaving the foreign body impacted in the œsophagus; and in the case of a foreign body impacted in the upper part of the œsophagus we have this advantage over the strangulated intestine—that the means to be adopted are simply and readily used, and there need be no delay in putting them into practice—I mean extraction by forceps. Once given the position of the impacted body, the question of the possibility of its extraction by the forceps will soon be decided. As in the efforts to reduce the hernia, so here, any prolonged and forcible efforts will certainly do harm, and may jeopardise the patient; so that a short and gentle trial with various forceps is all that good surgery will endorse, and this failing (as I have shown it will very often do), then it is at once the safest and the quickest method to place the patient fully under an anæsthetic, and, having made one more trial with the forceps, to proceed to perform œsophagotomy.

The after-treatment is often troublesome. The case I am about to relate had more than its share of difficulty; but the question of feeding will always be a trouble, and I think this may be lessened by considering beforehand the best methods. No absolute rule can

be laid down applicable to all cases, but I think in a majority it will be found that feeding the patient by tube, not through the mouth, *but through the wound*, is the safest and best method. This, of course, presupposes that we fail to obtain primary union, but it is only in the cases where primary union has not been obtained that difficulties of feeding arise, and in these I advocate the introduction of a catheter, or rubber tube, through the wound, and twice a day the injection of suitable fluid food into the stomach.

Case.—On the morning of 13th July, 1886, as I was seeing my children-patients in the Madeleine ward of the Adelaide Hospital, I heard a peculiar sound, which instantly caused me to look round to see from whence it came. The sound was a cough—a very peculiar, ringing, laryngeal cough, and yet it was not at all croupy; a throatish sound it was, but not exactly corresponding to any of the well-known throat coughs. I perceived that the sound which had caught my ear came from a very miserable-looking little child, who was being held in her mother's arms at the door of the ward. The mother, who was the opposite of miserable, being very fat and soncy, came forward at once, at a sign from me, and said she had come to ask my opinion about her child, who, three months previously, had swallowed a steel roller belonging to her sewing machine—the fellow of which she showed me. It was a double steel plate, in size somewhat larger than a sixpence; the two plates separated by a roller, and with a hole through the middle. She gave me the following history :—She had lost several children from different causes ; this child was born with a blood-mark over the whole left side of her face, with partial paralysis of her right arm and leg, and was of a fretful, irritable temper—supposed not to be " all there "—and yet the mother prized and petted her. Three months before the day she was speaking to me, the child, who had a strange cunning and mischief about her, got hold of this steel roller, and put it into her mouth ; the mother at once suspected that she had swallowed it, more particularly from the purple, choking state she was in. She at once brought the child to the Mater Misericordiæ Hospital, where she saw one of the surgeons. The father, a warder in Mountjoy Prison, then subsequently sought the advice of the surgeon of the Prison, who carefully examined the child, and gave it as his opinion that the roller had passed down into the stomach. He probably attributed the signs of throat trouble to

the injury done in swallowing the roller. The surgeon of the Mountjoy Prison continued to attend the child, and afterwards, in his absence, another surgeon constantly visited her, but neither of them seems to have had any doubt as to the situation of the foreign body, although the mother sometimes ventured to suggest that it might still be in the throat. It appears that I had attended some of her family, and she had originally proposed bringing the child to me, but was overruled by her husband. Now, however, three months having elapsed, and the child's symptom growing worse rather than better, she determined to delay no longer, and hence her visit to the hospital upon the 13th of July. Upon examination externally, I felt in the left side of the neck, on a level with the cornua of the os hyoides, a hard, fixed, irregular body, which seemed to me to be probably the lost steel roller. A careful examination internally confirmed this opinion, for, the child's mouth being held wide open with Fergusson's gag, I passed the forefinger of the left hand down into the pharynx, and distinctly felt the sharp edge of some metallic substance; the spot where I felt this corresponded with the spot externally where the hard substance had been already discovered. The diagnosis as to the position of the foreign body was thus complete. The next step was its removal. As it felt to the point of the finger very fixed, and the examination had already much distressed the little patient, further proceedings were postponed until next day; both mother and child being admitted to the hospital.

Next morning, the 14th day of July, having secured the assistance of my colleagues, Mr. Heuston, Mr. Scott, and Dr. Bewley—Mr. Franks being out of town—I proceeded to remove the foreign body—determined to accomplish this if possible through the mouth, but, failing this, to perform pharyngotomy or œsophagotomy. The patient was placed under the influence of chloroform, and I began by placing Fergusson's gag in the mouth, and handing this to Dr. Bewley, I then passed down a long curved forceps, with deeply serrated points, and touched the metal roller; it seemed at first certain that, as this was easily done, it could be removed in this way, but it was not so; either the forceps slipped off, or, when I obtained a particularly good grip, the metal body proved to be so firmly fixed in its place that it was impossible to move it. Mr. Heuston and Mr. Scott both tried, with the same negative result. So I then proceeded to remove it by external opening.

I made an incision two inches long, along the anterior border of

the sterno-mastoid muscle, its centre corresponding to the cornua
of the os hyoides; this exposed the sheath of the carotid artery,
which was carefully opened, and the vessels drawn outwards. A
curved forceps was now passed through the mouth into the pharynx,
and firmly pressed against the foreign body, which made it pro-
trude towards the wound—this was a valuable guide. I carefully
scraped through the back wall of the sheath, and came down on
the steel roller. The opening I had made into the mucous mem-
brane of the pharynx was so small that the roller was, with much
difficulty, brought through it after the manner of working a stud
through a button-hole which is too small for it. But I abstained
from enlarging the opening for the reason that I felt certain that
the smaller the opening into the pharynx the greater likelihood
was there of immediate union.

As soon as the foreign body had been safely extracted, the deep
wound was brought together by hidden antiseptic sutures—first the
mucous membrane by two sutures, then fascia, the muscles, fascia
again, and skin. Two drops of glycerole of nepenthe was adminis-
tered hypodermically, and a beef-tea enema, with a few drops of
brandy, was thrown into the rectum.

I have said that the child had a blood-mark on her face, and was
partially paralysed, but I did not know until the day after the
operation that she was an epileptic also. During the twenty-four
hours which followed the operation she had about twenty fits, some
of them very severe, some slight. She vomited frequently, the
antiseptic dressings were torn from the wound, and the contents of
the stomach forcibly ejected through it.

The first thing to be done when this state of things was dis-
covered on the morning after the operation, was to control the fits
by the free use of the bromides. But here another difficulty arose.
Swallowing was difficult and tedious, and always caused the fluid
which was passing down to escape to some extent from the wound.
However, five grains of mixed bromides was taken three times in
the day, but still the fits continued, although lessened. The dose
was increased to ten grains three times a day, and then the fits
ceased. Some of this was probably lost, as part was administered
with beef-tea enemas, but nearly this quantity was taken.

When the wound opened up, saliva flowed out through it in great
quantities, and any fluid which was attempted to be swallowed
passed freely out through it. I determined to make another
attempt to close the wound, so placing the little patient fully

K

under the influence of chloroform I carefully cleansed the wound, and catching the cut edges of the mucous membrane of the pharynx in a forceps I stitched them closely together, and then did the same for the sides of the wound and the skin, employing fine iron and silver wire—over all an antiseptic pad and bandage. The result of this operation was to limit very much the escape through the wound, but not entirely to stop it; but from this time the case, as far as the wound went, was more manageable, and plainly tended to success. I now began to feed the child by passing a flexible tube down from the mouth past the wound, and nearly into the stomach, and injecting through this tube strong beef essence, as much as half a pint being thus given twice a day; a little regurgitated up through the lower angle of the wound. For two or three days this was done, and then it had to be abandoned on account of the irritation produced in the pharynx by the passage of the tube; but I found the passage of a flexible tube *through the wound* to the stomach caused no irritation, and so twice a day the child was fed by this means; rectal alimentation was also continued, but as it was only secondary, twice a day was enough, and the help thus gained was important. No further epileptic fits occurred, but the emaciation was extreme, and bed-sores formed, despite the greatest care, on the most prominent points of pressure. By the end of August the wound had contracted to the size of a No. 10 catheter, and the child's condition was improving daily. The mother then took her home, and I did not see her again until the 5th of October, when she brought her to see me—or to be seen by me. I found the wound *firmly* and *evenly* united; the child was in all respects in good health, the sores on the back had all healed, and scarcely left a mark. When tested as to her powers of deglutition and of swallowing solids and fluids, I found she could do both very well, but her mother told me that sometimes fluids regurgitated through the nose. The child had a more healthy look than she had when I first saw her, which was when the foreign body had been lodged in the pharynx for *three months.*

SECONDARY SUTURE OF ULNAR AND MEDIAN NERVES.

By J. H. SCOTT, M.B., F.R.C.S.;
Surgeon to the Adelaide Hospital.

[Read at the Surgical Section, March 18, 1887.]

THE operation of nerve suture is of comparatively recent intro-
duction, and from the fact that none of the published cases, as far
as I can find, have been recorded by Irish surgeons, I may be
excused for bringing before the Surgical Section one of a class of
cases which is so trivial in its surgical aspects.

When a mixed nerve trunk is divided there ensue immediately
certain conditions of the parts below division which are always
easily recognised. I refer to loss of sensation, complete motor
paralysis, lowering of temperature, and disorders of circulation.
More remote from these, we have arrest of nutrition in the part
supplied by the mixed nerve trunk. These conditions arise from
section of motor, sensory, trophic, and thermic fibres, although the
existence of the two latter sets of fibres is denied by some physiolo-
gists.

In dealing with a divided nerve it is of some importance to clearly
understand the pathological state of both central and peripheral
ends, and for this purpose it is necessary for a few moments to
digress from the strictly surgical aspect of the case.

In section of a mixed nerve all the fibres in that part of the
nerve below the point of section degenerate, but as to the exact
nature and extent of this change authorities differ. Some hold that
the degenerative change is limited (for a considerable time at any
rate) to the medullary sheath, while the axis cylinder remains intact
for years. Others affirm, apparently with more reason, that the
axis cylinder partakes in the degeneration coincidently or imme-

diately subsequent to the medullary sheath, and that in a few weeks nothing of the nerve below the point of section remains but a thin fibrous cord.   Regeneration is also a debated question, as to whether the regeneration begins in the young cells of the perineurium, or by direct growth from the central end.   Wolberg and Schiff hold that the axis cylinder does not degenerate at least for years, and to this fact assign the success of nerve suture performed years after the injury.   Ziegler says—" New nerves are developed only from existing nerves."   Ranvier is more explicit—" The newly-formed nerve tubes, developed within the old degenerated tubes, do not simply result from genesis *in situ*, but are produced from buds of the axis cylinders of the central segment, which, continuing to grow, first reach the cicatricial cord, then the degenerated segment, and extend either into the interior of the old nerve tubes or between them.   The membrane of Schwann, the cellular elements which line it, and the medullary sheath, are alone formed from the proliferating cellular elements which have accumulated in the interior of the old tubes."   Now, without going further into the various arguments advanced by the upholders of these theories, taken altogether the weight of evidence seems to decide that the peripheral segment of a divided nerve degenerates *in toto*, and that regeneration proceeds only from the central end.   The time occupied by these processes depending in a large measure on the nature and extent of the injury, any intense inflammatory action consequent on the injury hastens degeneration and retards regeneration.   A nerve after division may, without having its segments in absolute contact, regenerate, but, where there is much separation and cicatricial tissue lying between and binding down the ends, regeneration is impossible without surgical aid.

The operations on divided nerves are classed under two heads— primary suture, or suture immediately after the injury, and secondary, or suture at any time subsequent.   This division is of no pathological importance, as in either case the peripheral segment dies, although some observers affirm that primary adhesion of the segments—that is, each axis cylinder and medullary sheath uniting without cicatricial tissue to its fellow—can occur in freshly divided

nerves, if immediately the ends are brought together—a condition analogous to the supposed primary adhesion of simple incised wounds of the other soft tissues—so that regeneration in primary and secondary cases differs only in degree—the less the disturbance of parts, and the less the exudation of young cells, the more rapid will be the process of repair and restoration of function.

I now come to the method of operation. Transplantation of part of a nerve, even in cases where a slender bridge exists between the central and peripheral ends, is an operation based on an erroneous pathology, as it interposes between the cut ends a tissue which, at best, is certain to degenerate into a fibrous cord, and thus opposes an obstacle to the growth of the central end. In such cases, where it is impossible to bring the parts together, a portion of the bone or bones, as the case may be, has been removed so as to allow of coaptation. It has also been recommended to place a piece of decalcified bone tube between the cut ends, which should both lie within the lumen of the tube, since all that seems necessary for the growth of the central end is freedom from dense adhesions, and a track through which to grow.

Twenty years have elapsed since the first successful case of nerve suture was recorded, yet in the first ten years of this period but sixteen cases were collected, while, during the past ten years, the operation has made many advances, and now, from all sides, we hear of successful cases. The operation itself is a delicate one and requires much time and patience, as the injury which necessitates it generally has caused, at the same time, a large amount of cicatricial tissue in which the nerve lies embedded. The central end should be first sought for, as by so doing the peripheral part is, in some cases, easily found by following the fibrous cord which runs between the two segments. This fibrous cord seems to be the rule in horses, but is not so constant in man. Both ends should be freely separated from the surrounding tissues for some distance ; the bulbous extremities being thus entirely freed are removed, and the freshly cut surfaces are brought together with catgut sutures. Writers lay great stress on the method of suture, some advocating the direct and others the paraneurotic suture. My experience on

the ulnar and median nerves is, that the direct is the safest suture, as the perineurium has not sufficient resistance to keep the ends together, in cases where there is any amount of strain on the point of union. To repeat a well-worn aphorism, the operation should be performed under strict antiseptic precautions, as union of the wound by first intention is essential to a good result.

The following are the notes of a case which I have at present under my care in the Adelaide Hospital, and for which I am in great part indebted to Messrs. Vereker and Hamilton :—

CASE.—J. S. was admitted under my care on April 3rd, 1886. Four months previously he sustained a severe wound of the anterior surface of right forearm, about one and a half inches above the wrist-joint. The injury was caused by his putting his hand through a plate of thick glass. He was a patient in the Drogheda Infirmary for five weeks, at the end of which time he was discharged, the wound having quite healed. He never had power or feeling in the hand since the accident. There was marked atrophy and paralysis of the muscles of the hand, and complete anæsthesia over the areas of distribution of the ulnar and median nerves, except in that part of the hand supplied by the ulnar dorsal branch. Sensation on dorsal aspects of fingers normal, as far forwards as base of second phalanges ; sensation greatly impaired, but not entirely lost, over second and third phalanges of ring and little finger. The hand was of much lower temperature than its fellow, and the circulation was greatly interfered with. The patient said that the finger nails had hardly grown at all since the injury, while the thumb nail required constant cutting. For these reasons it was evident that the original wound had divided the ulnar and median nerves at a point below the origin of the ulnar dorsal branch, and that the cut ends were separated and bound down by cicatricial tissue. There appeared also to be adhesions binding together the tendons of the superficial and deep flexors of the fingers.

On the 16th of April, 1886, assisted by my colleagues, I performed the operation of suture of the ulnar nerve, postponing interference with the median until I saw the result of the operation on the former nerve. On exposing the nerve the cut ends were found to be bulbous, lying about one-third of an inch asunder, and firmly adherent posteriorly. I removed the bulbous ends and freed the trunk of the nerve as far as the limits of the incision admitted.

In all about three-fourths of an inch of the nerve was removed, and in order to bring the cut ends accurately together, it was necessary to stretch the central portion to a considerable extent, and also to flex the hand almost to a right angle. Three direct catgut sutures were applied to approximate the nerve ends, and the wounded surfaces were brought together by buried and skin sutures. A dressing of sal alembroth gauze was applied.

Five days subsequently there was improvement of sensation, and the vascular condition contrasted favourably with that of the part supplied by the median. The wound was dressed on the 14th day and, found to be united by first intention. The patient shortly afterwards went home at his own request, promising to return after a short interval. At this time sensation had much improved in the area of distribution of the ulnar nerve, but was not very acute, as he could not distinguish a sharp from a blunt point.

J. S. presented himself for re-admission on August 2nd, 1886, condition being much the same as when last seen, except that the nails on ring and little fingers had grown.

On August 31st I performed a similar operation on the median nerve, slightly modifying, however, the method of suture. I introduced one end of a long catgut suture through the central portion of the nerve, at some distance above the seat of injury, and did the same with the other end of the suture to the lower segment; by drawing the two ends of the suture together all tension was relieved, and the cut surfaces of the nerve were readily brought together. Before introducing the direct sutures, however, I again found it necessary to stretch the central end, and also to flex the hand. On September 20th—that is, twenty days after the operation— the patient could distinguish the touch of a pin's point anywhere in the area of distribution of the median nerve, localisation, however, being very imperfect. At the same time the nails of index and middle fingers began to grow again. It is unnecessary to follow out the details of the case—suffice it to say that he has been treated with electricity and massage. Sensation is almost perfect. The nutrition has greatly improved, normal temperature being restored, and the circulation becoming again active. The adductor and opponens pollicis muscles as well as the interossei respond slightly to a medium interrupted current. The thenar and hypothenar eminences have lost their bare gaunt outline, and the interosseous spaces are filling up. The hand now perspires freely on passive motion.

Unfortunately, in this case, nerve suture cannot do everything, on account of the adhesions between the flexor tendons, and, consequently, the process of restoration to usefulness is much retarded. Eleven months have elapsed since the ulnar nerve was sutured, and six and a half since the operation on the median, so that, under continued treatment, I have every hope that the hand will become in great part restored.

In conclusion, I wish to direct attention to one or two points of interest in this case.

Mr. Hilton and Mr. Hutchinson some years ago called attention to the anatomical fact that the nervous supply of the dorsal surface of the two last phalanges was derived from branches of the palmar digital nerves. This fact was verified in the case I have related. There was complete anæsthesia over those regions, and the nails had ceased to grow—in fact, the nails of first and second finger seemed to have undergone partial necrosis, and are being pushed out by the new growth underneath.

The condition, past and present, of the nails seem to my mind to indicate the existence of trophic fibres; else, why was there cessation of growth? Mere inaction could not account for it, as the thumb nai never ceased to grow, although the thumb itself was as incapable of movement as the fingers.

In this case a longer time had elapsed between the injury and the operation than in almost any of the recorded cases, so that I am not disappointed at the length of time required for restoration. In some of the cases more than a year had elapsed without any improvement, and eventually complete recovery ensued.

ON SOME ELEMENTS OF SUCCESS IN EXCISION OF THE KNEE-JOINT.

By WILLIAM THORNLEY STOKER,

Fellow, Examiner, and Professor of Anatomy, Royal College of Surgeons, Ireland;
Surgeon to the Richmond Hospital, and to Swift's Hospital.

THE surgery of to-day is a science of great principles, but an art of small details. In view of the latter part of this postulate, I think it not without interest to relate a few of the practical conclusions I have come to with regard to certain methods to be followed in excision of the knee-joint, which, although small in themselves, help to greater ends. I do not purpose going into the subject generally, but recording some opinions I have formed as a result of my own practice and my observation of that of others. It is manifestly of interest that surgeons should state their views broadly ; we have too much in our current literature of details of cases, and too little of the general ideas arrived at by men of experience. My strong sense of the value of communications of this class is my reason for wishing to relate the conclusions I have formed on two or three points connected with excision of the knee, for my operative material has been at least sufficiently large and extended to justify me in putting forward what it has taught me. Besides, in a city so well supplied with hospitals as Dublin, and where they are so close together, surgeons see an amount of the practice of each other, which magnifies their opportunities of observation.

While I would not say a word to disparage the operation of knee excision in suitable cases, I think its results have been too favourably stated, and that many instances recorded early in their history as ones of cure have later on shown a return of disease. In Ireland our experience should naturally be less favourable, as the

bulk of our cases occur among tuberculous subjects. Age has been over-estimated as an influence for good or evil in this operation. Two of the best results I have had in my own practice were in patients who were aged five and thirty-nine years respectively. The first, a scrofulous subject operated on more than a year ago, is in active health, and able to walk with any ordinary child of her age ; the second, a farmer whose right knee I excised seven years ago when he was dying of pain and hectic, leads an active life, and can walk vigorously all day long. It is not correct to teach that removal of an entire epiphysis from a young bone of necessity involves a short limb. The child above referred to had such extensive disease that the entire epiphysis of her femur was removed, but only the upper surface of that of the tibia. She has grown rapidly since the operation, but the limb on which I operated is not an eighth of an inch shorter than its fellow. Nature is a bountiful mother, and a compensatory growth often takes place in those epiphyses which are not removed, so as to preserve activity and symmetry. The immature human being seems to have certain qualities of free and exceptional growth, which are perhaps an approach to the conditions of those lower creatures to whom the human embryo is related more closely than the developed adult.

Given a case of disease of the knee-joint well selected for operation, there are three factors of superlative importance in its prospect of success—

    1. Complete removal of all diseased structures.
    2. Relative permanence of dressings.
    3. Thorough fixation of parts.

1. As regards the first of these, I agree with Prof. Humphry that prolonged scrofulous suppuration is the most common cause of failure in this operation. It is of paramount importance to remove thoroughly not only diseased bone, but any soft structures which are engaged. The tissue which is at once the most rich in tubercular foci, and the most difficult to remove owing to its complex involutions, is the synovial membrane. I have latterly made it a general practice to divide the flap in the middle line as high

as the synovial pouch extends, and to make a careful dissection of the exposed membrane. This is an extremely tedious and troublesome proceeding, requiring the use of the scissors and of Volkmann's spoon as well as the knife. Of late my knee excisions occupy from an hour and a half to two hours, but surgeons who follow this practice will find their trouble rewarded by their results. I feel that some emphasis should be laid on this point, because it is not always sufficiently attended to ; and no better proof of this can be found than the comparatively short period usually occupied by an operation which, in cases where the synovial membrane is much diseased, demands a special expenditure of time.

2. To the relative permanence of the dressings employed, too much importance cannot be attached. To change a dressing soon or frequently, means distress to the patient, want of rest to the part, and a greater risk of septic troubles. The thermometer, aiding the educated eye and hand, will tell the surgeon when he must unseal his dressings. In all my late cases I have found it possible to keep the initial dressing on for from two to three weeks, and have once found the wound completely healed on its removal.

The first essential to securing permanence in dressing is that the wound should be absolutely dry and free from all oozing. With a view to the better attainment of this end I have relinquished the use of Esmarch's bandage, which we formerly employed in the Richmond Hospital in most cases of excision of joints. I use no tourniquet ; each vessel is secured by a catch-forceps, and tied as soon as possible. The hæmorrhage is extremely small, and, independent of the disappearance of the subsequent bleeding which follows the use of Esmarch's bandage, no matter how skilfully applied, there is less actual loss of blood than when it has been employed.

The method of dressing I have found most advantageous, has been used in conjunction with such usual strict antiseptic aids as need not be detailed, and is as follows :—The wound having been closed, the knee is carefully and evenly bandaged with carbolised gauze or sublimated muslin rollers, which keep the parts evenly

and gently supported for some inches above and below the seat of operation. The knee is then enclosed in a thick covering of iodoform cotton, evenly applied with a bandage, so as to give uniform and elastic support. The entire limb is bandaged with flannel rollers, one being applied below the dressings and a second above them. The splints are then applied.

3. Thorough fixation of the parts is a problem the difficulty of solving which is shown by the variety of splints and methods of suturing the bones which have been proposed. The splints I have used of late years are those of Mr. Patrick Heron Watson, as modified by my colleague, Mr. Thomson—that is to say, they are made of hoop-iron instead of cylindrical metal. When so constructed they can be used without cross pieces, and are not likely to slip to the side. The bridges opposite the knee afford every facility for changing the dressings without disturbing the splints. The use of plaster-of-Paris as a means of applying the splints I have abandoned; it is likely to get defiled by discharge, if there be any, or by excreta in children; it soon becomes loose, and its removal causes great pain and disturbance to the patient. If the splints are applied with flannel bandages they can be removed without inconvenience, particularly when the bones have been secured by the method presently to be detailed. No splint will, however, give by itself anything like perfect fixation to the divided ends of the bones, and all recorded means of suturing them which I have seen tried have been either defective or actually injurious. In considering this difficulty I devised a plan of securing the tibia and femur to each other, which I first put into practice on March 3rd, 1886, and which meets the want. I showed a dry preparation to illustrate the method, and a patient in whose case it had been used at the Academy of Medicine on May 21st, 1886. I also brought the treatment and the result of its application before the Dublin Biological Club on October 16th, 1886, when my friend, Prof. Bennett, suggested the application of the term "dowelling" to the procedure—a good explanatory name, and one which I have adopted.

The old saying, that there is nothing new, is borne out in this

case, for in the *British Medical Journal* of February 12th of the present year Mr. Morrant Baker records a method of securing the bones which resembles mine so closely that I might be supposed to have taken the idea from him, as he has used his plan since 1872. It was, however, not derived from the practice of any other surgeon ; and as it differs somewhat from his, and has given most satisfactory results, it may be worth description.

When the wound is ready to be closed, having punctured the skin on each side of the tubercle of the tibia with a tenotome, I insert a steel awl into the bone at each of these points. The instrument is made to enter the tibia in a direction upwards, backwards, and outwards from the middle line of the limb. It is only pushed into the bone for about three-quarters of an inch, so as to penetrate its compact covering and give the proper direction to the silver dowels afterwards used. A silver wire a shade larger in diameter than the awl, having its end filed to a chisel-shaped edge, is then pushed into each perforation, and, the femur being held in good relation with the tibia, is made to penetrate the upper bone as far backwards as the compact covering of its popliteal surface. The dowels may be either made to diverge or approximate as they pass upwards. The former direction is best, as they will when so introduced give greater fixity and freedom from rotatory motion than when crossed, as directed by Mr. Morrant Baker. They should not be parallel, as they then offer little resistance to vertical displacement. In the cases of very young children, one dowel introduced in the middle line below the tubercle, and directed upwards and backwards, will be found sufficient. It is important that the dowels should be a little larger than the awl, so as to fit tightly. The size most suitable is No. 14 Birmingham wire-gauge—that is, about the calibre of a French No. 7 bougie. The soft edge of the silver passes readily through the cancellous tissue, but with difficulty through the compact layer which covers it, and therefore, with a view to avoid entering the popliteal space, silver should be preferred to the steel recommended by Mr. Morrant Baker. It seems to me to be also preferable to the bone pins recommended by Mr. Howard Marsh, more easily introduced, with less injury of the cancellous tissue, and less liable to give way under any

sudden strain. The dowels are then cut half an inch from the skin, and their ends included in the dressings. I have usually removed them at the first or second dressing, from two to three weeks after the operation, and generally found the bones firmly united. It is better to use the dowels themselves to bore their way into the bone once the initial direction has been given by the punctures with the awl, as they fit more tightly, and thus afford greater immobility. They cause no irritation, and the sinuses remaining when they have been withdrawn heal almost immediately. Should these sinuses be found, on larger experience, occasionally to remain open, it would indicate the necessity for bone-drainage, which it seems to me they are capable under the circumstances of effecting.
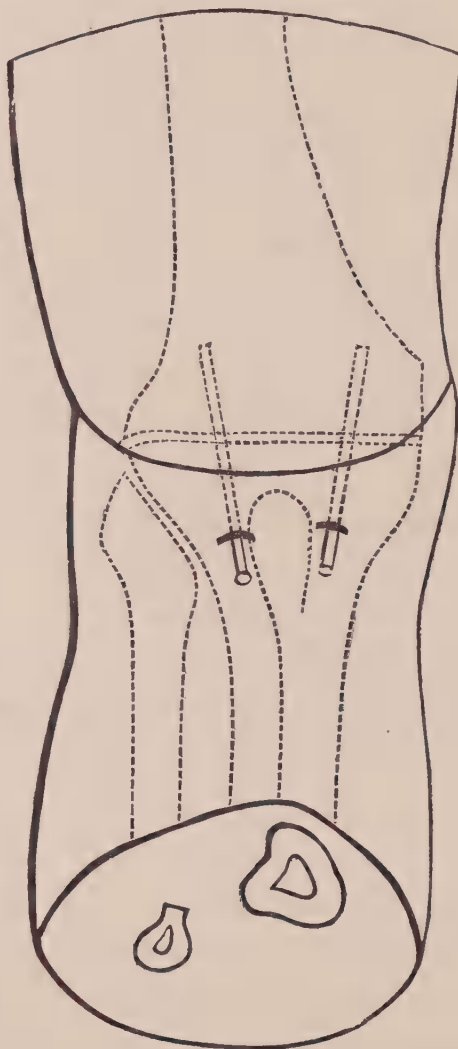
These dowels have been used during the past year not only by myself and my colleagues, Sir William Stokes and Messrs. Corley and Thomson, but by Mr. Franks, of the Adelaide Hospital. They all speak highly of their merits. The fixity of the bones is so complete that the patient is quite free from pain, and does not fear to move the limb or submit it to dressing or manipulation. Those who have seen the pain and terror of examination felt by children after this operation, and the constitutional disturbance due to these causes, will understand the advantage of a method which allows the limb to be moved freely when necessary.

As examples of the advantage of dowels, I may quote three cases in which I have used them :—

CASE I.—Maggie M., a delicate strumous-looking girl, aged seventeen years, with extensive disease of the bones, cartilages, and synovial membrane of the right knee, and much suppuration about the joint, was operated on in the Richmond Hospital on March 3rd, 1886. The first dressing was on March 17th, when one dowel was removed. The next dressing was a week later, when the second was withdrawn. The part was afterwards dressed occasionally, at long intervals, and the patient left hospital perfectly recovered, and able to walk, exactly three months after the operation.

CASE II.—Hannah Q., a scrofulous child, aged five years, with enlargement of the epiphyses of most of her bones, and with pulpy disease of the entire synovial membrane of her left knee, and extensive suppuration in the joint, was operated on in the Richmond Hospital on April 5th, 1886. This case recovered without any suppuration, pain, or rise of temperature. It was dressed only twice; the first dressing fourteen days subsequent to operation. In five weeks from the date of excision the child could walk without pain or assistance, and in a little over six weeks was exhibited at a meeting of the Academy of Medicine, perfectly strong and well.

CASE III.—Richard C., aged ten years, a delicate boy, in a hectic condition, with extensive suppuration and disease of all the hard and soft tissues about his left knee, was operated on in the Richmond Hospital on November 3rd, 1886. The first

dressing, when the dowels were removed, was on the sixteenth day. The bones were then firmly attached to each other. He suffered no pain or local inconvenience, but soon developed pulmonary phthisis, from which he died in the February following the operation.

These three cases, all occurring under unfavourable circumstances, both local and constitutional, afford fair examples of the use of silver dowels in fixing the bones. In my own practice I could quote no other group of three such unpromising cases, where the older methods of fixation were employed, where such rapidity of union occurred, and such complete immunity from suffering. These cases are not selected ones; they are the only instances in which I have myself used the dowels, and were taken at random as they offered themselves for treatment. My colleagues, who have all employed the same procedure, can add to the list of its successes.

Since writing the above, I have found it convenient, in the cases of adults, to have the dowels made of stronger wire. No. 12, B. W. G., is a suitable size. The end of the dowel, held by the operator during its introduction and afterwards cut off, should be turned as here represented. The dowels can be obtained from Messrs. Fannin.

SARCOMA OF THE TONSIL.

By HENRY GRAY CROLY, F.R.C.S.;

Senior Surgeon to the City of Dublin Hospital.

[Read in the Surgical Section, April 22, 1887.]

CANCER of the tonsil as a primary affection is very rare, and would appear to belong to the class of tumours known as sarcoma in the present day. When cancer spreads from the tongue to the tonsil as a secondary affection it is usually epithelioma. Whether true scirrhus ever commences in the tonsil is very doubtful. Malignant growths in the tonsil spread to the pillars of the fauces, involving also the glands of the neck, causing pharyngeal and laryngeal obstruction, and may be speedily fatal. When the tumour ulcerates it may cause death from hæmorrhage. Sarcoma of the tonsil may simulate tonsillar abscess, the differential diagnosis being extremely difficult, and no surgical writer has, to my knowledge, drawn attention to this very important fact.

Two cases of primary cancer of the tonsil having occurred in my practice—one recently—I consider it my duty to the Profession and to the Academy to bring them under their notice. While a student or house surgeon I never saw a case of primary cancer of the tonsil, nor was my attention ever directed to the subject by any lecturer or clinical teacher. I shall first describe the recent case, and refer to the other later on :—

CASE I.—M. D., aged seventeen years, was admitted into the City of Dublin Hospital, under my care, on the 22nd of April, 1886, suffering from a tumour involving the left tonsil and left side of the soft palate, causing much distress in breathing. The following is the history of his case, notes of which were taken by Dr. Lambkin, house surgeon :—

The boy states he enjoyed good health until six weeks previously to his admission, when he complained of a sore throat, which his

L

medical attendant (a very experienced practitioner) informed me commenced as ordinary quinzy, and so much did the swelling simulate tonsillar abscess when he visited the patient that he made an incision into the part, and was surprised at not finding any pus. The operation was repeated, and on the latter occasion blood flowed freely, and was with difficulty arrested. The case was then transferred to the County Infirmary, and subsequently to Dublin. Immediately following the incisions the tonsillar tumour grew rapidly and extended to the palate, and a glandular swelling appeared under the angle of the lower jaw on the affected side.

On looking into the mouth a tumour was seen filling the left side of the fauces—there was sufficient room at the right side to pass the top of the finger—the uvula was pushed obliquely in the direction of, and almost touching, the right tonsil. On passing the forefinger upwards behind the velum palati a second growth was felt towards the posterior naris. Externally a semi-elastic fluctuating tumour was observed below the angle of the jaw, and on passing the finger into the mouth it was ascertained that the sub-maxillary tumour had no connection with the internal tumour.

The patient says he does not suffer pain, but has much difficulty in breathing and swallowing, and has lived on fluids since the disease commenced. He is afraid to go asleep, fearing choking, and snores loudly if he does fall asleep. His voice is characteristic of tonsillar swelling.

On further examination I failed to detect evidence of disease of lungs, heart, kidneys, or other viscera.

From the history of the case, the rapid growth of the tumour, the glandular swelling, the elastic semi-fluctuating sensation felt on manipulation, and the smart hæmorrhage when the part was incised, I at once came to the conclusion that the case was one of malignant disease, commencing in the tonsil and rapidly involving neighbouring tissues.

In order to relieve the urgent dyspnœa, and with a hope of being then able to remove the tumour with greater safety, I proposed performing tracheotomy; and having explained the nature of the bronchotomy and its object to the patient and his mother, both at once consented to the operation. Sir James Paget being in town, I asked him to see the patient with me, which he most kindly did at Mr. Edward Hamilton's house. Both these surgeons examined the case thoroughly, and Sir James Paget expressed his

full concurrence in my view of the case and in the intended operative measures, as did Mr. Hamilton. Accordingly, on May 4th, I performed tracheotomy. No special difficulty was encountered. I removed a circular portion of the air tube and inserted a full-sized silver double trachea tube.

The patient was much relieved by the bronchotomy, slept well, took his nourishment freely, looked quite happy, and in a very few days he went about the ward. The external tumour almost disappeared, and on examining the fauces in the presence of the class I was much surprised at the disappearance of all the swelling except slight enlargement of the tonsil. So remarkably had the tumour disappeared that I really thought the enlargement must have contained fluid, which escaped after the tracheotomy.

This deceptive disappearance of the internal and external growths soon became apparent, as the tumour reappeared in the digastric space; and on the 18th of May, a fortnight after the tracheotomy, I excised the glandular growth, which contained a gelatinous fluid. The edges of the wound healed by immediate union, and the patient was going about on the third day, much improved in appearance, and enjoyed the open air, and took his food well. The internal tumour also recurred rapidly, and on June 21st I proceeded to operate in the following manner :—

Ether having been administered, the shoulders were raised, the mouth gagged, and the fauces plugged with sponge. The patient was kept under an anæsthetic during the operation, through the trachea tube. The growth was removed by means of the benzoline cautery. Very little blood was lost.

The patient experienced much relief from the removal of the tonsil and palate tumour, but this improvement unfortunately was of short duration. In two weeks the sufferer complained of shooting pains up the side of his head and in his ear, and got drowsy. These symptoms were followed by a rapid recurrence of the tonsillar swelling, also enlargement of the cervical glands, wasting, and hectic.

I advised his mother to bring him home. Notwithstanding his condition, the poor boy was cheerful and arranged his fishing rod, intending to have some fishing when he went home. He was discharged from hospital, July 22nd, a fresh trachea tube having been inserted. On inquiry I ascertained that the poor fellow gradually sank and died on the 10th of October, five months subsequent to his admission to hospital, and a little over six months from the commencement of his dreadful malady.

The internal and external tumours were sent to the College of Surgeons for examination, and the Curator, Dr. Alexander B. M'Kee, wrote thus—" I examined the tumour removed by Mr. Croly from the left tonsil and soft palate of the boy Doherty, as well as the tumour removed from beneath the angle of the jaw, and found that the microscopic character of both were those of a round-celled sarcoma."

Sir James Paget wrote—" I did not make any note of the case which I saw with you, but I remember it well enough to be nearly sure that the tumour was such a one as twenty years ago would have been called medullary cancer, but now would be called sarcoma; whether it was a small-celled sarcoma or an adeno-sarcoma I would not venture to say or guess. I am sorry you were not more successful, but, at least, you lengthened the poor fellow's life and helped him to die with less distress."

CASE II.—Occurred in a man nearly fifty years of age, recommended to my care by my brother, Dr. Richard Croly. The left tonsil alone was affected. The case commenced as ordinary tonsillitis; the development was very rapid. An exploratory incision had been made before my brother saw the case, so closely did the tumour resemble tonsillar abscess. No pus escaped.

The deceptive sense of fluctuation was very remarkable; the glands in the neck were affected. I advised the patient to return to his home. In a short time hæmorrhage set in, and the sufferer sank from exhaustion caused by repeated hæmorrhages and hectic.

Various operations have been suggested and practised for the removal of the tonsil.

Foule's method is by making an incision from the angle of the mouth to the angle of the lower jaw, division of the bone—widely separating the divided portions—and exposure of tonsil, which can be removed by means of Paquelin's knife.

Cheevers (of Boston) published a case in the *Boston Medical and Surgical Journal* of excision of the tonsil by the following method:— " An incision was made below the angle of the jaw, three and a half inches along the anterior edge of the sterno-mastoid muscle; a second incision along the lower border of the jaw—the flaps

reflected; digastric, stylo-hyoid and stylo-glossus muscles and fibres of the superior constrictor were divided on a director; pharynx was opened, finger swept round tonsil which was enucleated; hæmorrhage free; twelve ligatures applied."

Erichsen removed a tonsil with ecraseur.

In Doherty's case I believe the operation of bronchotomy was specially called for, but it is very questionable whether the further operative measures were useful, and I am inclined to think the patient might have lived quite as long had nothing been done except opening the windpipe.

EXCISION OF THE WRIST.

By W. I. WHEELER, M.D. Univ. Dubl.; F.R.C.S.;
Surgeon to the City of Dublin Hospital.

EXCISION of the wrist comprises, correctly speaking, not only removal of the articulating portions of bone forming the radio-carpal articulation, but also the carpus and the bases of the metacarpal bones. The amount of bone excised by this operation differs widely from the analogous operation on the ankle-joint, which is confined to portions of the tibia and fibula, with part of the astragalus. Disease of the wrist, unlike that of the larger and simpler joints, cannot be referred to a distinct origin—viz., to the synovial membranes, or to the bones of the wrist. The lower articular end of the radius, and that of the ulna, which in relation to excision is associated with the wrist, the carpus and the bases of the five metacarpal bones, are all so very contiguous as to obscure the precise seat of origin in caries of the wrist; then, again, the three synovial membranes in relation to the origin of the disease, as synovitis, are as one; the membranous covering of the radio-carpal articulation, which occasionally communicates with that of the radio-ulnar articulation through an aperture in the triangular fibro cartilage; the investment between the two ranges of carpal bones with two prolongations upwards, which sometimes extend into the synovial membrane of the radio-carpal articulation; and the three prolongations downwards which extend to and invest the four inner carpo-metacarpal articulations, and the separate synovial sac for the articulation in the thumb.

Caries of the wrist is not uncommonly of scrofulous origin, some trifling cause exciting the disease; while, again, synovitis may arise, followed by caries and articular disorganisation.

Moreau the younger seems to have been the first to perform this operation—excision of the wrist. The result is reported as successful, but no very definite history exists. In 1849 Heyfelder operated on this articulation with similar success; and in later years Erichsen, Stanley, Butcher, and Lister.

The amount of bone to be removed in this operation will depend on the amount of disease. Thus the excision might only include the lower ends of the radius and ulna, and adjoining carpal bones. I always myself remove the entire carpus and bases of the metacarpal bones; for in removing disease here, while we may take away the carious bone, it is not at all improbable that partial opening or puncturing of the adjacent articulations might occur, and subsequent inflammation, suppuration, and ulceration of the cartilages result.

The following is a short history of the last four cases of excision of the wrist I performed :—

CASE I.—Private P. H., 2nd Welsh Regiment, aged thirty-eight, was admitted into the City of Dublin Hospital on the 20th of October, 1884, suffering from disease of his right wrist-joint. There was considerable thickening of all the tissues, and several sinuses leading down to carious bone; from each opening there flowed a semi-purulent discharge. The history of this case is well described by the patient, and I give it in his own language :—

" Whilst employed in wheeling a barrow with a barrel of water in it, which tilted over, and in trying to save it I felt a burning pain go up my right arm. I took no notice of it for a few days, until I found it becoming very painful and also swelling. I at once reported myself sick and was put under medical treatment, which lasted about ten weeks, the treatment being—held under a tap of cold water, painted with liniment of iodine, and blistering, which appeared to do no good. I then came with an officer to Dublin for the purpose of trying to save my hand. I was directed to attend the —— Hospital, which attendance lasted ten weeks. I was then relieved of a great pain by —— putting a tube through my wrist for the purpose of draining it. Seeing it was of no avail, his opinion was that amputation was necessary. I then left the hospital, and through the influence of the gentlemen of my regiment I was sent to Surgeon Wheeler (Baggot-street

Hospital). I was there about three weeks under observations, after which he undertook to operate on my hand (which was about the 2nd November, 1884), extracting some bones from my wrist, which, no doubt, was the cause of saving my hand."

There was not the slightest difficulty in deciding that the case was one specially suited for excision of the wrist. I performed this operation by lateral incisions, and removed the entire carpus and the articular surfaces of the radius and ulna, together with the bases of the metacarpal bones. Esmarch's bandage was then removed, and three small vessels were twisted ; the hand and arm was placed in a straight splint, with a suitable elevation, to fit the palm of the hand and allow the fingers to be slightly flexed. Secondary hæmorrhage occurred three days after the operation, which was controlled by means of compresses. From this date the patient rapidly progressed to cure. You have had an opportunity of examining him here to-night, and I cannot believe that any more favourable result could be obtained. He has the power of flexion and extension, can grasp, hold his sword, and lift comparatively heavy weights. He was discharged healed on the 13th of December, 1884, but two months from the date of his admission into hospital, and one month and eleven days from the date of operation.

CASE II.—The next case is Mrs. ——, aged forty-six years, admitted 8th February, 1886, suffering from inflammatory action of her right wrist-joint. She states that a knitting-needle ran into her hand close to the radio-ulnar articulation some months before admission, which caused considerable pain and swelling. On examination her fingers were found to be semi-flexed and œdematous. She experienced considerable pain on pressure, and also when the radial articulation was forcibly pressed together. Having applied Esmarch's bandage and the patient being fully anæsthetised, I made two incisions, the radial one from the styloid process on a dorso-radial aspect, to the radial aspect of the second metacarpal bone, thus avoiding the radial artery ; the ulnar incision commenced about two inches immediately anterior to this bone, which I carried down as far as the middle of the fifth metacarpal bone, at its palmar aspect. The operation was then continued on

the lines described by Lister. No vessels had to be ligatured. A splint, as in the former case, was applied on the palmar aspect of the hand and forearm. A large drainage-tube having been inserted, as in the former case, from one incision to the other, this patient progressed rapidly to cure. She does not possess as much power of flexion over her fingers as in the case already described, but she has a very useful hand, which enables her to knit, and materially assists her in her avocations. She was admitted on the 8th of February, 1886, and discharged, healed, on the 15th April, 1886. This case was also shown here to-night.

CASE III.—The third case was a young man, aged thirty-two, who suffered from carious disease of his left wrist-joint, due to inflammation following on an attack of gonorrhœal rheumatism. I operated on him, after the manner just described, on June 11th, 1886. He made a slow recovery, and one of the apertures through which the drainage-tube passed did not heal up until December of last year. I do not think that there was a single bone of his carpus free from disease; five sinuses existed. The result is now very satisfactory. He can flex his fingers, and is gradually gaining more power. I saw him three weeks ago.

CASE IV.—The last of the four cases is that of a gentleman, aged fifty-one years, who, two years ago, hurt or strained his left wrist-joint when lifting a bar of iron, and afterwards received a blow on the same joint. It was much inflamed after the first injury, but the inflammation considerably subsided under the treatment which was pursued. He never completely recovered, and the second injury induced some additional inflammation, followed by thickening, and eventual suppuration; an abscess had been opened by his attendant before I saw him. I operated on this gentleman two and a half months ago after the manner described in Case No. 2. Dr. Harley gave the ether. Brigade-Surgeon Dooley and one of my hospital pupils assisted me. The entire of the carpus and bases of metacarpal bones were removed. He has progressed favourably, can move his fingers, and takes outdoor exercise for several hours daily.

The foregoing is a brief history and description of the last four cases in which I have excised the wrist-joint. In concluding this paper I may draw attention to the treatment, which I will divide into that before, and that after the operation. Before the operation

it is necessary to flex and extend the fingers, in order to break down any adhesions that may have taken place, to insure satisfactory motion. In the after-treatment two objects must be kept in view—firstly, to procure anchylosis of the wrist by retaining it in a fixed position for a period of about seven weeks; and, secondly, to maintain the flexibility of the fingers and the thumb, commencing flexion on the third or fourth morning after operation, which should be continued daily. Pronation and supination also must not be long neglected. When patients commence to carry their arms in a sling the weight of their hands will make them gradually drop to the ulnar side. This can be counteracted by applying a light poroplastic splint along the ulna, and side of hand.

Several methods of operation have been suggested—firstly, a curved incision from the styloid process of the radius to the styloid process of the ulna; secondly, two lateral incisions—along the radial and ulnar borders.

A single ulnar incision was deemed sufficient by Sir W. Ferguson. Again, by others, two incisions—one into the palm, the other on the dorsal aspect.

Velpeau made a quadrilateral incision—others an H incision. I prefer the lines of Lister, with the slight modification of the radial incision described; it gives more room, does not endanger the tendons or radial artery; it is easier to protrude the bones by this incision. I have operated in one case by Langenbeck's method. I cannot advocate it.

With regard to the first case I have recorded, and which you have examined here, I do not think that there could be a more satisfactory result. This man was doomed to lose his hand, and recommended and advised amputation. He is a living specimen of the advancement and progress of surgery.

Some years ago, at the old Surgical Society, I deprecated the use of Esmarch's bandage in cases of excision of joints. I do so still for the reasons then stated; but I make an exception to this rule in excision of the wrist-joint.

TWO CASES OF COLOTOMY IN WHICH THERE WERE ABNORMAL CONDITIONS.

By WILLIAM THOMSON, M.A., F.R.C.S. ;

Surgeon to the Richmond Hospital ;
General Secretary to the Academy of Medicine in Ireland.

THE operation of colotomy has not yet been practised often enough to make us acquainted with all its possible difficulties; and it is for this reason that I wish to make a few observations upon the subject. In August, 1884, I was asked to see, in consultation, a lady who was the subject of malignant disease of the rectum, and who had been suffering from complete obstruction for about a fortnight. She was very much exhausted, the abdomen was greatly distended, and although she occasionally was able to get rid of some flatus, the total amount was so small that her distress was in no way relieved. I made a prolonged attempt to pass a urethral bougie through the minute central canal which I could feel in the nodulated mass in the rectum, but without success. The effort had already been made on a previous day with a like result; and, as the symptoms were urgent, I recommended that the colon should be opened on the left side. This was accordingly undertaken on the 15th of August, when I had the assistance of the late Dr. Benjamin M'Dowel, Mr. Thornley Stoker, and Dr. Kavanagh, of Kingstown. The incision was made midway between the last rib and the crest of the ileum, the centre being about half an inch behind the central point of the iliac crest, as recommended by Allingham. The parts were very carefully divided to the full extent of the wound in the skin, and finally the transversalis fascia was cut through. We were now in a position to search for the gut, and I looked for it in its usual position at the

posterior extremity of the wound. Instead of finding, however, a large distended colon, there was a tube about the size of small intestine. I examined it carefully. It was somewhat thick-walled, but it did not present any of the longitudinal bands characteristic of the colon, neither had it the greenish colour, nor did it contain any material that could be recognised as fæcal. I next explored its relation to the kidney, and it appeared to lie in close proximity to the lower part of that gland. The tube was not in any degree tense; but what it was that had got into this place none of us could tell. Finally I punctured it once or twice with a needle, but nothing escaped. In front of it lay a larger gut, to which I now turned more particular attention. It did not present the greenish colour upon which so much stress is sometimes laid as enabling us to identify the colon, neither were the longitudinal bands visible; but a deeper examination of its attachments showed that it was connected to the posterior abdominal structures in the usual position of the colon, and we determined upon opening it. I rolled the gut so as to get at its posterior surface uncovered by peritoneum, but I found that this membrane almost enveloped the intestine. In my efforts to get at the back of the colon I opened into the abdominal cavity, but I sewed up the rent with carbolised catgut and it never gave me any more trouble.

I first transfixed the sides of the wound and the colon with a large needle in two places, and the intestine was then opened so as to allow the loops to be drawn out. These were divided, and the opening was secured to the external wound by four silk sutures. Catgut was used to secure the intervening portions of the edge of the intestine to the skin. A copious discharge of fæces followed. The dressings consisted of iodoform and pads of wood wool. The wound healed without difficulty. The patient was able to go to the drawingroom in a fortnight, and to go out soon afterwards. She remained in fairly good health, and did not suffer any special inconvenience from the opening in the colon. Death followed in 21 months, rather suddenly, and was believed, I understand, not to be the direct result of the disease in her rectum.

Now, the point of greatest interest in this case is the position of

the colon. The universal teaching of the books that I have con-
sulted is that the colon is to be found at the most posterior point,
and it was owing to this that we prolonged our examination of the
strange tube which none of us could identify, and which perplexed
us so much. Some time ago, with a view to solve the difficulty, I
made an inspection of a frozen transverse section of the body,
which was made by Professor Cunningham, of Trinity College,
and a drawing of which has been kindly made for me by Dr.
Arthur Thomson, Professor of Anatomy at Oxford. The section
passes through the 3rd lumbar vertebra. You will observe on
examining it that the colon lies in front of the quadratus lum-
borum muscle, covering the greater part of that structure, but
that on the remainder of this surface, and lying between the colon
and the line of incision, is a section of intestine, which, from its
internal structure, is to be recognised as the jejunum. In fact,
the colon is hidden in a somewhat quadrilateral space, the
boundaries of which are, quadratus lumborum posteriorly; intes-
tine externally; intestine anteriorly; and psoas internally. If an
incision for colotomy were made in this case, we should come
upon the jejunum and not upon the colon at all. My first im-
pression was that I had solved the problem, and that what I saw
and punctured was in reality a piece of small intestine; but it
was pointed out to me that I must have opened the parietal
peritoneum to get at it; and with the exception of the small open-
ing which I accidentally made subsequently, I was not conscious
of having done so. I could not have done so, if this tube was
really small intestine, without observing it, unless, indeed, the
parietal peritoneum was adherent to the tube.

But a consideration of this section does suggest a difficulty
which might occur, and for which we ought to be prepared.
You will perceive that the reflection of the peritoneum in the
section before you is normal—that is to say, a portion of the
posterior surface of the colon is uncovered by peritoneum. But
occasionally there are seen cases in which this arrangement is not
present, or in which there is, at all events, such a laxity of the
peritoneal ligaments as would permit of displacement of the colon

forwards. If you still look at this illustration you will see how the colon, distended with flatus or solid material, could extend forwards past the jejunum, which lies on its outer side, and, overlapping that portion of the intestine, appear at the bottom of the wound second in order from the quadratus lumborum, and not first.

The subject obtains additional interest and importance from the observations of Mr. Treves, in his recent lectures on "The Anatomy of the Intestinal Canal and Peritoneum in Man" (*Brit. Med. Journ.*, March 21, 1885). In the course of his lecture on the ascending and descending colon, he remarks :—" Considerable importance attaches, from a surgical point of view, to the frequency with which a mesocolon may be anticipated in connection with the vertical parts of the large intestine. With this anatomical circumstance the operation of lumbar colotomy is very intimately concerned. The usual statement made in surgical text-books upon this subject is to the effect that a mesocolon is more often found upon the right side of the body than upon the left, and this statement is used as one argument in support of left lumbar colotomy. I made a careful examination of the peritoneal investments of these parts of the colon in the 100 subjects dissected, with the following result :— In 52 bodies (that is, in about one-half) there was neither an ascending nor a descending mesocolon. In 22 there was a descending mesocolon, but no trace of a corresponding fold on the other side. In 14 subjects there was a mesocolon to both the ascending and descending segments of the bowel; while in the remaining 12 bodies there was an ascending mesocolon, but no corresponding fold on the left side. It follows, therefore, that in performing lumbar colotomy a mesocolon may be expected upon the left side in 36 per cent. of all cases, and on the right in 26 per cent. From the standpoint of development and comparative anatomy it would certainly be expected that a descending mesocolon would be much more frequently met with than an ascending mesocolon. In the lower animals the former membrane is always extensive and conspicuous. It is well marked in all species of monkey, and even in the anthropoid apes. It is the remains of

the primary vertical fold of peritoneum, whereas the ascending mesocolon is a secondary production—a fold acquired by a certain phase in the development of the bowel. The line of attachment of the left mesocolon is usually along the outer border of the kidney, and is vertical. The attachment, therefore, has been moved some distance from the middle line, along which it would have originally extended. The line of attachment of the ascending mesocolon is, as a rule, less vertical, and is found crossing the lower end of the kidney from right to left, and then ascending along the inner margin of the gland. In like manner, when these folds are entirely absent, the left colon will be found to be adherent to the parietes along the outer border of the kidney, while the right will be fixed a little obliquely to the anterior surface of the lower end of the corresponding gland, and then along its inner margin. The ascending mesocolon will vary in breadth from one inch to two inches, while the fold on the left side will vary between one and three inches."

I have refrained from discussing the general aspects of this operation, now so frequently successful when undertaken at the proper time, but I wish to direct attention to conditions which may hamper us greatly in the performance of it. Recognition of the colon by its position in the wound, its structure or its colour, cannot be relied upon as invariably true. In this case none of these gave us any aid. Allingham, who has done between 30 and 40 colotomies, says:—" In most of my cases one of the longitudinal bands was clearly observed," which clearly implies that this indication was not always apparent. Amussat found help in the ascending and descending movement of the small intestines, corresponding to respiration, the lumbar colon not participating. All these suggestions show that it is not always a simple matter to find the colon; and I have added a difficulty to which, so far as I know, attention has not been before directed. It will be found, however, that in the majority of cases some of the guiding marks are present; and I may add to these the indication which will be most persistent— namely, the position of the attached surface of the colon along the outer margin of the kidney.

The second patient whom I operated upon was an old man over seventy, who consulted me in August, 1885, for chronic diarrhœa. He had lost much in weight, and nothing had helped to stay the discharge. I examined his rectum carefully, but could not reach any obstructing mass. An examination through the abdominal walls revealed some fulness in the region of the sigmoid flexure, and above it, and I suspected that this was the source of the mischief. He was not, however, suffering any pain; there were no indications of fæcal lodgment, and I prescribed for him, telling him to return in a few weeks. In September there was no improvement, and on the 24th of that month I was sent for to see him. He was confined to bed, the abdomen was distended, fæcal discharge had stopped for a day or two, and there was frequent vomiting, with a loaded tongue and a rapid pulse. The fulness in the sigmoid region was now very marked, and, in consultation with Mr. Thornley Stoker, it was agreed that the colon should be opened. This I accordingly did next morning, with the assistance of Mr. Stoker, and Mr. (now Sir) W. Stokes. There was some little difficulty about identifying the colon at first, but it was recognised by its containing a small scybalous mass, and then by its longitudinal bands. The bowel was secured as in the last case, and opened. There was, however, no escape of fæces, only of a little dark-coloured fluid. The wound was dressed with iodoform and cotton wool, and it healed up rapidly. The patient's condition was improved, the vomiting and flatus disappeared, and the only thing he complained of was pain in the sigmoid region, and weakness. The morning dressing, however, continued to show nothing more than a slight brown stain, and this absence of copious discharge assisted in the rapid healing of the wound, about which there was never any difficulty. I waited on patiently for some fæcal evacuation, but it only appeared in full quantity on the 17th day after the operation, and it afterwards came regularly. On the 19th day I told the patient he might leave bed on the next. When I called, however, he said he felt disinclined to get up for a day longer. That day, however, never came, for he gradually sank and died on the 23rd day after the operation.

The only point of interest in this case is the long delay which occurred before the evacuation through the opening in the colon. It is not rare to find cases in which a few days do elapse ; but so far as I have been able to consult reported cases, I have not found one in which so long a period intervened as in this instance. Whether the cause was atony of the bowel, or some pressure exercised by the growth, I cannot say.

I was not anxious to be active in treatment, seeing how well the patient was during the time. But in any case it is well to record the fact I have here stated, as one of the unusual conditions which may attend the operation of opening the colon.

CONTRAST BETWEEN LAPARO-COLOTOMY AND LUMBAR COLOTOMY.

By CHARLES B. BALL, M.D., F.R.C.S.;

Surgeon to Sir P. Dun's Hospital; University Examiner in Surgery, and Examiner in Surgery, Royal College of Surgeons in Ireland.

THE recent improvements in rectal and abdominal surgery have, to a certain extent, limited the number of cases in which colotomy is indicated; and no doubt, where possible, ablation of the rectum, linear proctotomy, and resection of the colon, are all operations to be preferred to the establishment of an artificial anus. While, however, assigning to each of these operations their utmost limits of utility, there remains a considerable number of cases in which colotomy must still be looked upon as the proper treatment.

As the object of this procedure is to provide an alternative outlet for the intestinal contents through which more or less incontinence of fæces is a necessary result, it follows that the condition of the patient afterwards is by no means pleasant to himself or those about him. It is, therefore, only to be undertaken in cases in which the indication is very clear, and after the patient has been fully told of the inevitable result of the operation. In the case of imperforate infants, where perinæal incision has failed, it is the duty of the surgeon to lay the case fully before the parents, telling them that life may be possibly saved by means of colotomy, whereas without it death is certain. The onus of deciding for or against colotomy should be thrown on the parents in cases of imperforate rectum; but where the patient is an adult, suffering from obstruction, he alone must decide. In the latter case the pain and distress are usually so extreme that the sufferers generally gladly accept the conditions, and when the case is successful in relieving

urgent symptoms, are loud in their thanks for the relief obtained. The surgeon has no right in these cases of his own motion to act as the arbiter between life and death; and, if he fail to recommend colotomy in urgent cases, he is, in my mind, as guilty of dereliction of duty as if he refused to sanction tracheotomy for the relief of a patient suffering from obstructed glottis.

It is necessary to clearly indicate the conditions calling for this operation, and they may be conveniently grouped under the following heads :—1. Congenital malformations which cannot be relieved by perinæal incision. 2. For the relief of distress attending recto-vesical fistula. 3. For obstruction, the result of (*a*) pressure of tumours; (*b*) cancer of the bowel; (*c*) non-malignant strictures, which are of such an extent as to preclude perinæal operation. 4. As a means of treating extensive ulceration, by providing physiological rest to the part.

Lumbar Colotomy.—" Amussat's operation " has hitherto been the form most frequently recommended by modern surgeons where the patient was an adult, while the inguinal, or Littré's operation, has been principally confined to the treatment of cases of imperforate anus, the reason assigned being the frequency with which a mesocolon is met with in the infant.

It is unnecessary for us here to discuss the manipulative details of these two operations as usually performed, as they are sufficiently familiar to all operating surgeons; but, in order to establish the comparison between them, it will be necessary in the first place to consider the *Accidents during and consequent on the Lumbar Operation.*—Wound of the peritoneum is of frequent occurrence; and when there is a mesocolon present, its injury is inevitable. If the opening is at all free, prolapse of small intestine is likely to take place, and considerably complicate the operation. In such a case the proper course would be—having reduced the prolapse an aseptic sponge should be plugged into the wound, and the search for the colon prosecuted, and as soon as it is found the peritoneal wound must be carefully closed before attempting to open the bowel.

In some cases the operator has failed entirely in finding the

colon, some portion of the small intestine being opened in its place. It is hard to imagine how this accident has occurred on the left side, because the small intestine could be reached only after the peritoneum has been opened, and under these circumstances the appearance of the longitudinal bands and appendices epiploicæ are so characteristic of the large intestine, that with ordinary caution the distinction should easily be made. On the right side the mistake of opening the duodenum instead of the colon appears to me to be a much more real danger. One of the most experienced colotomists at present living has candidly admitted that this accident has occurred in his practice.

During the after-treatment one of the greatest dangers is the occurrence of diffuse inflammation and suppuration along the areolar spaces of the abdominal wall. I have seen very extensive sloughing of the skin of the loin follow an operation of this kind.

Although it is impossible, from the nature of the wound, to follow strictly the rules of antiseptic surgery, much may be done in this direction with sublimate solution and iodoform; but the most important of all measures, I believe, is the accurate suturing of the mucous membrane to the skin, and thus preventing extravasation of fæces.

During the after-treatment also, a collection of fæces in the lower segment of the gut is a troublesome complication. When occurring to any extent it may produce, as Bryant has pointed out, symptoms of intestinal obstruction, notwithstanding the fact that an outlet for fæces exists higher up; and even where this is not the case, the irritation in cases of malignant ulceration defeats to a great extent the object of the operation, while in cases of vesico-intestinal fistula the trouble is even more exaggerated. In order to remedy this several suggestions have been made—(1) To pass the sutures deeply, so as to include the entire thickness of the bowel instead of its posterior aspect only. As this, however, necessitates the passage of the sutures across the peritoneal cavity, it does away with the sole advantage claimed for lumbar colotomy. (2) It has also been attempted to bring out a knuckle of intestine at a very acute angle, in the hope that in this way a spur might

be formed similar to that which is found in artificial anus following hernia. (3) The only proceeding, however, by which the advantages of lumbar colotomy can be combined with absolute closure of the lower segment, is by means of the operation recommended by Mr. P. Jones.[a] He detached the mucous membrane from a prolapsed portion of gut, and from the lower margin of the colotomy opening, turning it on itself, and attaching the raw surfaces by means of the catgut, and afterwards brought together the surfaces denuded of mucous membrane. No fæcal matter passed beyond the opening after this procedure had been carried out. Of course it is obvious that no attempt to close the lower opening should be contemplated when there is a possibility of establishing at some future date the normal exit for fæces.

Another troublesome after-complication is prolapse of the bowel through the artificial anus. This is frequently due to the continued expulsive effort trying to get rid of the accumulation of fæces in the lower portion of the bowel. It is to be treated by the adjustment of a well-fitting pad, and, if possible, by the closure of the lower orifice.

In common with all other extensive wounds of the abdominal parietes, hernia may occasionally occur. Of this accident Mr. Simpson records an instructive example.[b] Upwards of four years after the operation of colotomy, the patient felt something suddenly give way while coughing, and a tumour appeared immediately below the artificial anus, and he died in two days. At the *post mortem* the tumour was found to contain a large loop of ileum, in part gangrenous.

Statistics of Colotomy.—The most comprehensive record of cases of colotomy hitherto published is that by Dr. W. R. Batt,[c] and the following is his analysis of cases, slightly condensed:—Of a total of 351 operations, 154 were performed for malignant disease, 20 for fistula, 52 for imperforate anus, 40 for obstruction, 72 for stricture, 4 for ulceration, and 9 for miscellaneous causes. The

[a] British Medical Journal, April 24, 1886. P. 782.
[b] British Medical Journal, May 23, 1885. P. 1,039.
[c] American Journal of Medical Science, Oct., 1884. P. 423.

recoveries were 215, deaths 132, equal to a mortality of 38 per cent., the result of 4 cases being unrecorded. Of these, the number of operations performed by Amussat's method was 244—165, or 68·2 per cent., recovered; 31·8 per cent. were fatal; and the result in 2 cases is unrecorded. After Littré's method 82 operations were performed—of these, 38, or 46·9 per cent., recovered, and 43, or 53·1, proved fatal, the result in one case being unrecorded. After Callisen's method 10 were operated upon, 2 of which recovered, 7 were fatal, and in 1 the result is not stated. Four cases were performed by Fine's method, all of which are recorded as having been successful. In one fatal case a T-shaped incision was adopted, while in 10 the method of operating was not stated. Of these, 6 recovered and 4 proved fatal.

According to these statistics, the mortality of inguinal colotomy is 20 per cent. greater than that of the retro-peritoneal operation. According to Erckelen's statistics,[a] the mortality shows a difference of 10 per cent. in favour of Amussat's operation. I think, however, that it will be admitted that statistics of this kind, which are collected from published cases, are at all times misleading; but especially is this the case in the instance at present under consideration, for in the first place the inguinal operation has been selected in a large proportion of the total number as a treatment for imperforate rectum, and frequently not adopted until after an extensive exploration from the perinæum, when the patient was nearly exhausted. And, again, as these statistics contain the records for many years back, they embrace a period when peritoneal surgery of all kinds was in a very different condition from that in which it is at the present day, so that I think the time has come when the relative merits of both operations may be fully discussed without our being too much influenced by the results obtained under the older methods of wound-treatment. The unquestionable advantages of laparo-colotomy are these:—1. It permits a thorough exploration of the abdominal cavity, which may enable the surgeon in some instances to perform a more radical operation for the complete removal of the disease, and if removal is imprac-

[a] Archiv. f. klin. Chir. Langenbeck, 1879. P. 41.

ticable it insures that the opening is made above the seat of obstruction instead of below, as has happened with the lumbar operation. 2. The large intestine is found with ease and certainty. 3. A complete operation for closure of the lower lumen when considered necessary can be much more readily and completely carried out, thus making the artificial anus a *terminus*, and not a lateral outlet to the intestine. 4. A shorter distance of intestine intervenes between the opening and seat of disease. 5. The abdominal wall being thinner in front, the extent of wound-surface is less, and the finer skin of the front abdominal wall permits a much more accurate coaptation of skin to mucous membrane. 6. The position of the wound is much more convenient for the patient, and it is interfered with less by the clothing. So, then, the sole disadvantage of laparo-colotomy is the necessary wounding of the peritoneum; and it must be remembered that even in the hands of skilled colotomists wound of the peritoneum in the lumbar operation has not infrequently taken place. It is manifestly easier to deal with a peritoneal wound advisedly and carefully made, than with an accidental opening at the bottom of a rather deep incision.

Delayed Opening of the Intestine.—"Operation à deux temps."— The unequivocal advantage which has been found to follow the division of the operation of gastrostomy into two stages has naturally suggested a similar manner of proceeding in colotomy; and cases have recently appeared in which both laparo-colotomy and lumbar colotomy have thus been performed. In a communication made to the Clinical Society of London by Mr. Davies Colley,[a] three cases are recorded in which the lumbar operation was performed in two stages; the intervals being one, four, and six days respectively. It would appear from these cases that the procedure necessary to retain the loop of bowel in the wound was attended more or less with symptoms of intestinal strangulation; and in order to minimise this result as much as possible, Mr. Davies Colley has devised a form of clamp, in which two pairs of ivory studs placed on steel bars are made to grasp the bowel at two places, and by this means the loop of intestine is held without

[a] Lancet, March 21st, 1885.

being strangulated, until sufficient healing of the wound has taken place to obviate any risk of extravasation. In two out of the three cases this instrument was used, and the resulting constitutional symptoms are described as being trivial.

The analogy between gastrostomy and colotomy, however, scarcely holds; because the mere fact of retaining a small portion of the stomach wall in the abdominal wound can have no direct influence one way or the other on the œsophageal disease for which the operation has been undertaken ; while in the case of the colotomy a certain amount of obstruction will probably have existed before the operation, which will be rendered absolute by the drawing out the loop of intestine, and to the symptoms of obstruction will be added more or less those of strangulation. Indeed, it is a very common result of colotomy to have some vomiting and depression for the first two or three days, which may, in all probability, be ascribed to the strangulation of a small portion of the intestinal wall by the sutures. And it is obviously a prolongation of this trouble if after three or four days the bowel is opened, and a fresh set of sutures put in.

I operated on a case of rectal cancer in November, 1884, by laparo-colotomy, having chosen this operation as I thought that possibly I might be able to do the more radical operation of excision. As the disease was so extensive that excision was deemed impracticable, a loop of the sigmoid flexure was drawn out, emptied by pressure upwards from the seat of obstruction, and caught between two clamps. It was now divided between the clamps, the wall of the lower segment was inverted so as to bring the peritoneal surfaces into apposition, and carefully sutured up, and the upper orifice was stitched to the wound. This patient lived for two years and a fortnight after the operation. Until a short time before her death she was able to go about and attend to the artificial anus without help; the bowels moved but once a day, and she was conscious that the motion was coming sufficiently long beforehand to make all the necessary preparations. In a more recent instance I again selected laparo-colotomy in a case of rectal cancer, and I adopted a method which so absolutely prevented extravasation that

I venture to think it will prove more useful than the method of performing the operation in two stages. An incision about four inches long was made in the left linea semilunaris, this position being selected for the following reasons:—It freely exposes the sigmoid flexure; it is made without cutting muscle; the parietes are thinner here than elsewhere, and no vessels of importance are wounded. The deep epigastric artery is quite safe from injury if the lowest limit of the incision does not pass a line drawn from the umbilicus to the middle of Poupart's ligament. The upper limit of the cancer having been determined, the gut was emptied upwards by careful pressure, and a loop of bowel drawn out. A narrow-bladed clamp was now applied to the intestine, so as to prevent any fæces coming down, and a similar one applied to the distal extremity of the loop. In the present case, Ricord's phimosis forceps, covered with rubber tubing, and closed by means of elastic umbrella-rings, were used for clamps. I have since had a special clamp made, which has the advantage of having the blades move quite parallel. By means of a screw the exact amount of pressure necessary to retain the loop of intestine in the grasp can be applied, and a double angle permits of the blade portion lying easily within the peritoneal cavity. The clamps being applied, a number of sutures were passed through the abdominal wall, including the peritoneum, on one side, through the intestine *in front of the clamp*, and through the peritoneum and abdominal wall on the opposite side. Eleven sutures were in this way passed, five perforating each portion of intestine, and one passing through the mesocolon. The bowel was now opened between two aseptic sponges, and the interior carefully cleansed of mucus and fæces. The loops of the sutures were hooked out from within the lumen of the bowel, cut, and the central ones tied on each side; the suture through the mesocolon was also tied, the sutures through the angles of the abdominal wound and outer borders of the bowel alone remaining unclosed. A number of superficial sutures were now put in so as to render the application of the mucous membrane to the skin extremely accurate all round, except at the angles where the handles of the clamps lay. The clamps were now withdrawn one

by one, and the remaining sutures at either angle simultaneously closed, thus shutting off the opening into the peritoneal cavity at the moment that the clamps released the bowel. The single suture through the mesocolon is, I think, of use in insuring a larger surface of peritoneum being in apposition to the abdominal wound, and the second clamp on the distal extremity of the bowel, although not as essential as the other, facilitates the operation considerably. In this case I did not close the lower lumen, as there was very considerable discharge from the cancer, and I wished to be enabled to wash the lower segment out occasionally ; but it could have been done, if considered advisable, with the greatest facility. This patient recovered well, and was much relieved by the operation.

Prognosis.—In estimating the probable result of colotomy, it is necessary to carefully classify the cases. Where the operation has been performed for malignant disease, the duration of life can be prolonged only to a certain extent, the disease progressing and ultimately proving fatal. According to Batt, in 32 per cent. of the cases operated on, death was apparently directly due to the operation when performed for malignant disease ; and of 105 that recovered, and whose subsequent history was traced, it was found that six died within two months of the operation, seven died between three and six months after operation, fifteen died between six months and one year, ten died between one and two years, eight died between two and three years, and one died four and a half years after operation. Of thirty-two patients recorded as being well after the operation, only one had survived two years ; and one, one year. It is of course obviously impossible to form any estimate of how long these patients could have lived if colotomy had not been performed.

In my own practice I have performed colotomy five times for rectal cancer. In three cases the lumbar operation was selected ; one of these patients lived six months, another three years, and one is alive at present ; and in two in which laparo-colotomy was selected one lived two years and a fortnight, and the other is alive at present.

It has, however, been suggested that this operation has a direct

influence in checking the growth of disease. There is in the Hunterian Museum a very beautiful specimen (No. 2,591), taken from a case of colotomy of thirty years' standing, in which the mucosa of the rectum below the opening has undergone atrophy and become villous, these changes being apparently the result of disuse. It is claimed that, as the form of cancer usually found in the rectum is so completely formed of glandular tissue, the abrogation of function of the rectum induced by the colotomy will be followed by atrophy of the morbid growth as well as of the normal structures. I do not think, however, it is safe to draw conclusions as to the result of a certain procedure on a pathological formation from the changes induced in normal structure, as the conditions of growth under the two circumstances are so essentially dissimilar; and the dreary record of early death after operation shows conclusively that the progress of disease in these cases is not to any great extent arrested.

That life can be prolonged when death is threatened by obstruction is of course certain, and probably the diversion of fæces from the surface of the malignant growth, and absolute rest insured for the part, tend somewhat to retard the growth; and anyone who has witnessed the relief afforded to a person suffering from obstruction, by this operation, will at once admit the complete justification of the procedure. The immediate result is much influenced by the stage of the disease at which the operation is performed; most of the fatal results being due to what Mr. Bryant has truly called " too late " cases.

I believe that the most important evidence that the case is too late for operation is the presence of extensive meteorism. Where the bowel has been hyper-distended it is in such an atonic condition that it may be unable to recover itself after an outlet has been provided, and if such should prove to be the case a rapidly fatal result must follow. Extensive meteorism is in itself also a very serious complication to the manipulative details of laparocolotomy. I recently witnessed an operation under such conditions. The moment the abdominal incision was made, a very extensive prolapse of small intestine took place, which could not be restrained.

The recommendation of Mr. Greig Smith was followed, and an incision made in the small intestine, which was then as far as possible evacuated; the incision sutured, and the intestine returned to the abdominal cavity; the colon was now drawn out, and the operation completed; but the patient never recovered power over the intestine, and died in two days. In a case of rectal obstruction with extensive meteorism I have recently adopted the lumbar operation, instead of laparo-colotomy, with a satisfactory result, and I am strongly of opinion that the sole reason for selecting the former operation should be the existence of this symptom.

OBSTETRICAL SECTION.

PLACENTA PRÆVIA.

By R. H. FLEMING, M.B.;

Assistant Physician, Rotunda Lying-in Hospital, Dublin.

WITH regard to the ætiology of placenta prævia little is known. It arises when the ovum is embedded close to the inner os, so that primarily the decidua scrotina is developed, and subsequently one or more cotyledons of the placenta are connected with it.

Causation.—The supposed causation of this anomalous attachment is as follows :—

(1) A too capacious uterine cavity.

(2) Undue smoothness of the endometrium. Those conditions are found most frequently in multiparous women who have borne children with great rapidity ; in such cases the uterus is generally in a state of subinvolution, the endometrium congested, hypertrophied, and bathed with leucorrhœal discharge, and so affords a less firm attachment to the ovum, which slides down the uterine wall until arrested by the more constricted cervical zone. This may account for the comparative infrequency of the anomaly in primipara—the proportion, according to Lusk, being 1 in 6.

Professor Muller holds the idea that the descent of the ovum is favoured by uterine contractions setting in soon after conception, and may result in abortion, or the ovum may become adherent to the cervical zone and undergo development until the condition of placenta prævia reveals itself.

Dr. Tyler-Smith supposes placenta prævia to be due to the non-impregnation of the ovule until it has reached the lower uterine zone.

Another and rare cause may be mentioned, and that is, the faulty course of the Fallopian tubes. Ingleby mentions two cases where the orifices were situated near to the inner os; in one of those cases placenta prævia occurred three times, and in the other ten times.

With regard to the time at which the hæmorrhage takes place, Professor Schroeder states that the bleeding is ushered in by the pains in partial prævia, and that in cases where the presentation is complete it is rarely accompanied by pain.

This, I think, will be borne out by a case I shall describe towards the end of the paper; and in the few cases of central placenta which have come under my notice the contractions have followed rather than preceded the manipulation necessary for the control of the hæmorrhage.

Now, with regard to the source of the discharge. It is a settled point that it is chiefly derived from the vascular system of the mother; for at each placental separation large lacunæ are opened up, which are filled with maternal blood, and are the source of profuse hæmorrhage.

Schroeder gives the probable source of the hæmorrhage as follows :—

(1) That the uterine contractions force blood from the place whence the placenta has been detached.

(2) Unguarded examination may lacerate the placental tissue, and cause thereby extensive hæmorrhage from the child.

To this last cause, I think, may be added cases of low attachment of the placenta complicated with a velamentous insertion of the cord. A nice example of this anomaly was discovered by my colleague, Dr. Alfred Smith, who on examining the placenta after expulsion found that both these conditions existed; also that several of the funic vessels narrowly escaped being ruptured owing to the passage of the head through the membranes close to their course.

Dr. Matthews Duncan says that the so-called unavoidable hæmor-

rhage in no way differs from that occurring from the separation of a normally implanted placenta, and that the condition of prævia merely predisposes to it. He mentions the four ways in which he thinks bleeding may occur :—

(1) By rupture of a utero-placental vessel at or near the inner os.

(2) By rupture of a marginal utero-placental sinus within the area of spontaneous premature detachment when the placenta is inserted with only its margin at or near the inner os.

(3) By partial separation of placenta from accidental causes.

(4) By partial separation of the placenta, the consequence of contractions producing slight dilatation of the inner os. This last, he considers, takes place when labour has commenced; and the term " unavoidable" may, he says, be employed here.

Jacquehim holds that the placenta remains practically stationary during the latter months of pregnancy, and when it is attached to the cervical zone, which increases more rapidly during this period, must become separated owing to the absence of simultaneous growth.

Dr. Barnes, on the contrary, says that the growth of the placenta is out of all proportion to that of this segment of uterus during the last three months; that, in fact, the placenta grew away from the uterus. The objection to both these theories is the fact that hæmorrhage often does not occur until labour has set in.

Sir James Simpson suggests that the bleeding escapes from the attached part to the detached part. Hence his treatment, which certainly arrested the hæmorrhage, but inevitably destroyed the child.

Now, with regard to the cause of the separation and the consequent hæmorrhage.

Dr. Barnes remarks that when the placenta is situated partially or entirely over the inner os, the expansion of the cervix, especially during labour, must produce separation and consequent loss of blood, and that the amount of hæmorrhage will depend on the rapidity and strength of the contractions, which will, by separating the placenta from the dangerous zone, and by rupturing the

membrane, effect a sealing up of the mouths of the vessels. In cases of central insertion, bleeding can often only be controlled by complete separation of the placenta. Dr. Simpson's evidence bears out this by showing that after complete separation of the placenta all bleeding ceased.

According to this theory the amount of hæmorrhage will be in inverse proportion to the rapidity and completion of dilatation.

This may explain the way in which certain cases of placenta prævia terminate favourably without interference.

Schroeder gives as his theory that in order that the fœtus may be expelled the lower segment of the uterus must assume the shape of a cylindrical canal; this is brought about by the extension, in a transverse direction, of the os internum and the adjacent parts, and accounts for the separation of the placenta in this way :—

(1) Because it cannot follow the physiological contraction of the uterus, the placenta becomes separated; so does it become separated because it cannot adapt itself to the extension.

(2) During labour the local relations between the surfaces of the ovum and that of the inner surface of the uterus undergo a remarkable change. The nearer we approach the os internum the more is this obvious. As the uterine wall at the upper pole of the ovum remains almost stationary, that corresponding to the lower pole is strongly drawn upwards, while the entire ovum is being expelled *en masse*, consequently the separation of the placenta is obviously explained as follows:—If now the bag of waters towards the end of the dilating period remains unbroken, considerable separation must take place between the ovum and the uterine wall; and should the placenta be attached to the lower segment, so long as the membranes are intact its relation to the uterus cannot alter without separation; consequently, the greater the degree of opening, the more extensive will be the separation, which will continue until the spontaneous or mechanical rupture of the membranes allows it to retract with the lower segment.

With reference to the more important part of the paper— namely, the treatment of dangerous conditions—I propose to give

some of the various methods that have been employed to control the hæmorrhage by the older writers, and then to contrast them with our more modern ideas.

If we examine the histories of 62 cases of placental presentation recorded in the statistical midwifery of Dr. Robert Lee (1848), we cannot but be appalled by the mortality both of mother and child, which we in latter times ascribe to the methods employed, making, at the same time, all due allowance for the absence of antiseptics as applied to obstetrics. Of these 62 cases there were 13 maternal deaths. The methods then at the disposal of obstetricians were as follows :—

(1) Plugging with some styptic, such as strips of linen steeped in vinegar.

(2) Rupture of the membranes, rarely tried alone.

(3) Podalic version, followed by immediate extraction.

(4) By instrumental means, applied early also.

Looking back 40 years we find that the routine practice was immediately to procure dilatation sufficient to admit, at all events, two fingers ; then having performed version, the operator proceeded to extract with all possible despatch, not recognising the risk of *post partum* hæmorrhage from laceration of the maternal parts.

I now propose to enumerate the various methods adopted in our own days, with a few statistics showing the result of the more modern treatment. They are—

(1) Puncture of membranes.

(2) Plugging.

(3) Entire separation of placenta.

(4) Version, either intero-external, or purely external version through abdominal wall.

(5) By means of instruments.

(1) Puncture of the membranes is universally recognised as the most valuable means of arresting the hæmorrhage ; it is, as a rule, easy to accomplish. By this treatment we allow the placenta to follow the movements of the cervical zone and to retract with it, and at the same time make the presenting part of the child to perform the part of a plug.

N

(2) Plugging must always be recognised as a treatment. However, in the cases observed in the Rotunda Hospital for the past three years this has not been once adopted, so far as I can remember; this may be due to the fact that we are able to have our patients always under supervision. In rural practice, however, it is more frequently required.

There has been a prejudice against the tampon, and justly, too, on account of the difficulty of keeping the material aseptic, and the trouble in preventing the decomposition of escaped blood. This danger has been, to a great extent, removed by the Listerian method, and it has still some warm supporters.

Thirty cases, extending over a period of three years, were treated by tampon under the auspices of Tarnier. In this collection there were three deaths, two occurring immediately and one from separation eighteen days afterwards.

With regard to the 3rd method of Simpson, complete separation of the placenta, it is rarely employed now. He advises this treatment when the following conditions exist :—(1) When the child is dead; (2) when the child is not visible; (3) when the hæmorrhage is excessive, and the os is not sufficiently dilated to admit of turning. I think, however, that the operation would be quite as difficult as the combined method of turning.

The 4th method of combined turning, or the intero-external, is one of the most certain ways of controlling hæmorrhage, and was first practised and spoken of by Braxton-Hicks in 1860, and 20 years later, after considerable opposition, its value was recognised by German authorities.

Dr. Lomer, writing in the *American Journal of Obstetrics* in December, 1884, says that the late introduction of the method for this class of case was owing to the following reasons :—

(1) Bimanual operations were unknown.

(2) Chloroform was unknown.

(3) The fact that bleeding could be arrested by version without extraction was unknown.

(4) The life of the child was valued too highly.

Dr. Lomer states that in 178 cases they had 105 infantile

deaths, or 60 per cent. This would argue strongly against the utility of making the mother undergo the risk of a forcible extraction on behalf of the child, whose chance of survival is so frail.

The same author states that in the same number of cases—viz., 178—treated by the combined method, a total of 8 maternal deaths occurred, or a mortality of 4·5 per cent., and claims for this method of turning the advantages—

(1) That by it the tampon is abolished, as the extremity of the fœtus will form a natural and aseptic plug.

(2) It permits of early operation before much blood has been lost.

(3) It arrests hæmorrhage.

(4) It gives the patient time to rally, the cervix time to dilate, and enables one to terminate the labour at the earliest possible date, and avoids *post partum* hæmorrhage from laceration by the too forcible extraction.

Schroeder also recommends version by the intero-external method as soon as the os is sufficiently dilated to enable two fingers to be passed through the cervix, and says, after bringing down a leg, to wait for sufficient dilatation to take place.

In some cases, say, before dilatation of the os and before the patient has had time to lose much blood, and where the abdominal walls were relaxed, I think we might try external version as a means towards effecting the control of the hæmorrhage.

The application of the 5th or instrumental method will depend on the stage we find the patient in.

We may safely employ the forceps in cases where the os is well dilated, the head fixed and well through the brim, and where no likelihood of any obstruction to the completion of delivery exists; but in all cases where the head is still movable, and the os not dilated, we prefer version; or if we have reason to suppose the child is dead, we perforate and extract if the hæmorrhage is very alarming.

Now, with regard to our routine at the Rotunda Hospital, our treatment is practically restricted to the following methods :—

(1) In all cases of *ante partum* hæmorrhage of importance we douche out the vagina with carbol. solution, 1 in 80 (not with

corrosive sublimate, as albuminate of mercury would be formed with the blood), in order to remove all blood from the vagina which might decompose. We then examine for presentation, and if normal, we then endeavour to rupture the membranes, and this, in a large number of cases, we find sufficient; if this does not suffice, however, we proceed to turn and leave the lower extremities projecting through the cervix, having drawn it down sufficiently to act as a plug. We then leave the case alone until it is expelled by nature, or assist it by gentle traction when we have reason to know the os is sufficiently dilated. This plan, of course, refers to cases where the bleeding comes in the early stages of labour.

To illustrate the efficacy of this mode of treatment I should like to quote a case which came into hospital :—

CASE.—In October last, during Dr. Macan's absence, patient for the third time pregnant, this time of twins. On inspecting the abdomen it was greatly distended, so much so that to feel the fœtal parts by palpation was impossible. On vaginal examination the progress of my finger was impeded by a large interstitial fibroid, observed almost two years before, and which filled up fully half the pelvic canal posteriorly. With some difficulty I reached the os, and found it almost entirely covered by placenta. Having discovered the membranes I ruptured them and brought down a foot, douched out the patient, and left case to nature for five and a half hours, when I extracted the fœtus; and on examining for the second child, found that the arm presented, as in the case of the first child. I soon discovered and brought down a foot and extracted, a way having been prepared by the previous child; they were both born alive, but died some hours afterwards. There was no *post partum* hæmorrhage, and the patient recovered without a bad symptom, although previous to delivery she was almost pulseless.

In this case there were several interesting points :—

1st. Placenta prævia existed.

2nd. Twins.

3rd. Excessive liquor amnii.

4th. Both children presented transversely.

5th. The pressure in the lower segment of a large interstitial fibroid tumour.

With regard to the statistics of the Rotunda Hospital for the past three years, ending November 3, 1886, during that period 4,514 births have taken place, and in that number we had 23 cases of placenta prævia. Of these 4 women died:—

No. 1 of pleuro-pneumonia on the 16th day.

No. 2 died of sloughing fibroid tumour.

No. 3. Patient collapsed while getting chloroform for the removal of adherent placenta 40 minutes after delivery.

No. 4 died soon after rapid delivery, owing to severe hæmorrhage. Perchloride of iron was injected; also salt solution, without effect.

Now, with reference to the infantile mortality, out of 23 cases observed, 10 children died.

These statistics, I think, will compare favourably with most hospitals; but, of course, the shortness of the observation and the lowness of the figures will detract from its importance.

THE TREATMENT OF VAGINISMUS.

By THOMAS MORE MADDEN, M.D., F.R.C.S.Ed.;

Obstetric Physician, Mater Misericordiæ Hospital;
Consultant, National Lying-in Hospital.

EXCESSIVE sensibility of the vaginal orifice and adjacent parts, more especially when associated with such spasmodic contraction of the sphincter vaginæ as to form an impediment to marital intercourse, or dyspareunia, occasionally becomes a matter of considerable gynæcological interest. In such cases the hyperæsthetic condition of the vaginal outlet is evinced even on the slightest attempt at local examination, and is most marked about the meatus urinarius, and in the vicinity of the orifice of the vulvo-vaginal glands and fourchettes, whence the hymen, if existent, projects upwards. The morbid condition of which these symptoms are pathognomonic, although clearly described by some of the older writers, was for many years ignored by gynæcologists, until its importance was re-discovered, and its treatment improved by the late Dr. Marion Sims, by whom the name it is now known by was applied to it. Since then, although much has been written on this complaint, its pathology and treatment are still, to a large extent, *sub judice.*

With regard to the pathology of the form of local hyperæsthesia understood by the term vaginismus, there are almost as many divergent views as there have been writers on the subject. Thus, according to Marion Sims, the symptoms of vaginismus are almost always neuromatous, whilst Dr. Alonzo Clarke, one of the ablest pathologists in America, who examined the vaginismus hymen frequently, could not find any enlarged nerve filaments running through it.

Mr. Lawson Tait, in the course of a recent discussion, in the British Gynæcological Society, on a paper of Dr. Bantock's on this subject, is reported as having expressed his regret that such a term as vaginismus had ever been coined. He had made eleven dissections, and found only in one of them a trace of the muscular fibres supposed to produce the affection. He believed it is due to fright or to disease of the vestibule, of which the most common is serpiginous vascular degeneration of the mucous membrane—an obstinate disease, ending in atrophic contraction of the vestibule. Sims, whose experience of this disease has never been exceeded, says:—"The most perfect examples of vaginismus that I have seen were uncomplicated with inflammation; but I have met with several cases in which there was a redness or erythema at the fourchette. Usually the hymen is thick and voluminous, and when the finger is forced through it, its free border often feels as resistent as if bound by a fine cord or wire."

According to Dr. Emmet, vaginismus is to be regarded purely as a symptom, denoting reflex irritation, of which the chief expression is an exaggerated sensitiveness about the hymen and vaginal outlet. As the irritation is transmitted through the sympathetic nerves, the effect is experienced at its terminal branches in the erectile tissue distributed about the entrance to the vagina. It is found only in anæmic and excessively nervous women, and in those who have in some manner overtaxed their nervous systems. Their general condition renders them peculiarly liable to neuralgia, of which the symptom under consideration is but a kindred ailment. The locality is determined as if it were by accident, or by some law of which we are ignorant. "It is an exception," adds Dr. Emmet, "to find any local exciting cause; occasionally there may be some cicatrical tissue about the perinæum or neck of the uterus, or some local inflammation or disease of the vagina, vulva, meatus, urethra, or vesical neck."

Dr. Graily Hewitt, on the other hand, is of opinion that the essence of the disease is a local alteration or irritation of the nerves at the spot itself; at the same time he also points out that the condition in question is a hyperæsthesia of the parts, dependent

not always on the same cause. The difficulty experienced in introducing the finger is dependent on the spasmodic contraction of the muscles. It has been described as most commonly present in individuals whose nervous system is generally in an easily excitable state. Dr. Ferguson believed that in cases of "irritable uterus," one of the seats of this neuralgic malady was the vagina itself, this latter being so exquisitely tender as to render intercourse intolerable. In Scanzoni's opinion the disorder especially accompanies anteversions, retroversions, flexions, or actual changes of the uterus itself, and that it is not rare in connection with spasmodic affections of the urethra, bladder, or rectum. The late Sir James Simpson in some instances found true small nodular neuromata under the mucous membrane.

For my own part I think the most rational explanation of symptoms of vaginismus is generally to be found in the hysterical temperament of the majority of those thus affected, although in some cases there is also present an abnormal condition of the pudic nerve, one branch of which runs along with the artery to the clitoris, whilst the other, or superficial perinæal nerve, is distributed to the perinæum and labia, in which its terminal branches ramify freely. This fact in the ætiology of the disease, although generally ignored by recent writers, is one the practical importance of which will be seen in connection with the treatment of vaginismus.

Treatment.—It was long since said by Dr. Marion Sims that whilst there is "no disease capable of producing so much unhappiness to both parties of the marriage contract, I am happy to state that I know of no serious trouble that can be cured so easily, so safely, and so certainly." With the first part of this sentence we must, I think, all agree, but with regard to the latter portion of it, in reference to the easy curability of the disease in question, I regret to say that my own experience is by no means satisfactory, as in certain instances I have found no little difficulty in dealing with extreme cases of vaginismus by any of the plans of treatment generally recommended. It therefore appears to me that every case of vaginismus should be treated on its own merits—

that is, with less reference to the name given to the disease than to its special causes and prominent symptoms in each individual instance. As a rule, in the treatment of such cases very undue importance is given to the local operative measures on which the different theories adopted by each special authority on the subject leads them to place exclusive reliance, whilst the constitutional treatment which is invariably necessary in all cases of well-marked vaginismus is too generally ignored. For whilst operative measures directed to the hyperæsthetic structures and adjoining parts—such as excision of the hymen, division of the pudic nerve, destruction of erythematous and serpiginous patches, dissections out of neuromata, &c.—may each be indispensable in certain cases of vaginismus, in quite as many instances they are unnecessary; and from my own clinical experience I can vouch for the possibility in some cases of relieving the most intense dyspareunia resulting from this cause, so as to enable the patient to fulfil all her duties as a wife and eventually as a mother, without any operation beyond the forcible mechanical expansion of the vaginal canal. Before, however, resorting even to this expedient we should, in the first place, employ the sedative treatment, not only local but also general, which is indicated in all other local manifestations and consequences of constitutional nervous or hysterial disorders, and which, as I believe, is essential in nine-tenths of the cases of vaginismus that come before us, whilst in only one-tenth of them is any surgical or operative measure necessary.

Amongst the topical palliative remedies that may, conjointly with the constitutional nerve sedatives just referred to, be employed with a reasonable hope of advantage in these cases are the bi-daily use of warm baths and vaginal irrigations, the local application of a five per cent. solution of hydrochlorate of cocain or of glycerine of carbolic acid, or the introduction of suppositories of cocain and belladonna. When such palliative measures have been fairly tried without advantage, we may then resort to mechanical dilatation of the vaginal orifice and stretching of the pudic nerve. For this purpose, having first fully etherised the patient, a large

sized Graily-Hewitt bivalve speculum should be introduced and
expanded to its fullest extent.   Then a tampon of absorbent lotion
large enough to fill the speculum should be soaked in glycerine
and passed up to the cervix, its lower end projecting through the
external opening of the instrument.   This, still fully expanded,
should then be forcibly drawn out, leaving the central tampon
behind in the vagina.   It need hardly be observed that this proce-
dure invariably occasions severe pain.   At the same time, however,
it as certainly tears through some of the superficial submucous
muscular fibres of the affected part, as well as effectually stretches
the terminal vaginal branches of the pudic nerve, and thus affords
a generally efficient and safe method of overcoming the spasmodic
contraction with which we have to deal in cases of vaginismus.
Any subsequent contraction or hæmorrhage that may follow this
procedure is sufficiently met by the tampon, which may be retained
for at least twenty-four hours; and after some days, should there
be still a continuance of vaginismus, the same method of treatment
may be again repeated.

In other cases, however, this method of treatment does not
suffice, and in course of these instances I have, with advantage,
resorted to Sims's operation for vaginismus.   This consists, as you
are doubtless aware, in the removal of the hymen if present, which
may readily be dissected out with a properly curved scissors,
after which a vaginal plug must be worn until the parts are
healed.   The cicatrix resulting from this operation is then to
be divided.   For this purpose we must, as Sims recommends,
place the patient (fully etherised), as for lithotomy, on the
back; pass the index and middle fingers of the left hand into the
vagina, separate them laterally, so as to dilate the vagina as widely
as possible, putting the fourchette on the stretch; then with a
common scalpel make a deep cut through the vaginal tissue on one
side of the mesial line, bringing it from above downwards, and
terminating at the raphe of the perinæum.   This cut forms one
side of a Y.   Then pass the knife again into the vagina, still dilat-
ing with the fingers as before, and cut in like manner on the oppo-
site side from above downwards, uniting the two incisions at or

near the raphe, and prolonging them quite to the perinæal integument. Each cut will be about two inches long—*i.e.*, half an inch or more above the edge of the sphincter, half an inch over its fibres, and an inch from its lower edge to the perinæal raphe. Of course this will vary in different subjects according to the development of the parts in each. To perfect the cure it is necessary for the patient to wear for a time a properly adapted bougie or dilator.

Marion Sims's procedure, just described, has been modified and improved by Dr. Emmet, who also, after etherisation and placing the patient in the lithotomy position, introduces the speculum under the arch of the pubes, so as to bring the posterior wall of the vagina into view. The index finger is inserted within the anus, and the sphincter is pressed up against the posterior wall of the vagina. It is then easy to divide with scissors the fibres encircling the vagina on each side, just within the fourchette, and about three-quarters of an inch apart. This does not allow a prolapse of the vaginal wall, as when the perinæum is lacerated, whilst it permits of an equal extent of dilatation of the outlet by the glass plug.

In some cases I have found the hæmorrhage following these operations sufficiently serious, and in one of these I have to thank my friend Dr. Horne, our Hon. Secretary, who was called in in my absence, for the arrest of very alarming loss of blood, occurring some hours after the operation, in the case of a young lady on whom I performed Sims's operation.

It should be observed, however, that even in cases of vaginismus so extreme as to effectually prevent complete marital intercourse, the disease is not necessarily an absolute barrier to impregnation. In one instance of this kind that came under my observation some years ago, so extreme was the local hyperæsthesia as not only to preclude the probability of complete cohabitation, but also to prevent the patient's submitting to any local treatment for the relief of the morbid condition. Nevertheless conception occurred, and I subsequently was called in to deliver her at full term, and in doing so was obliged to incise the still unruptured hymen, by which delivery was obstructed.

CASE OF PORRO'S OPERATION FOR RUPTURE OF THE UTERUS.

By S. R. MASON, M.D., F.R.C.S.;

Master of the Coombe Lying-in Hospital; Lecturer on Midwifery, Ledwich School of Medicine.

THE importance of the subject of treatment in cases of rupture of the uterus, and more particularly of the performance of laparotomy in these cases, must be my excuse for bringing the following brief notes of a case of Porro's operation under the notice of this Section of the Academy of Medicine:—

CASE.—A patient was admitted to the labour ward of the Coombe Hospital on Friday, Nov. 5th, at 8 p.m., whose labour had begun on the previous Tuesday with good labour pains, which continued throughout Wednesday. On Thursday morning early the pains ceased for a few hours, but returned again at midday and continued strong until 5 30 the same evening, when she felt something give way within her and a cold sensation pass through her abdomen, accompanied by some motion of the fœtus and a profuse sanguineous discharge from the vagina. It was impossible to discover at what period of her labour the liq. amnii escaped.

She was attended by the medical officer of a dispensary district situated about eight miles from Dublin from the commencement of her labour on Tuesday till Friday, when her husband, seeing that no progress was made, called in another medical man, who recommended that she should be sent into hospital. Before her admission to hospital she had borne two full-time children; both labours were difficult and tedious, but were terminated by the natural efforts, the child in each case being stillborn. When admitted she was in a condition of marked collapse, the pulse being 130 per minute and hard to count; respiration shallow and hurried; face pinched and worn, and very anæmic.

On inspection the abdomen was found to be irregular in shape, a marked bulging being present on the left side, about three inches above the umbilicus, which could easily be recognised as being a fœtal arm lying directly behind the abdominal walls without the intervention of any uterine covering. The abdomen felt soft, flaccid, and doughy, having completely lost that firm resisting sensation conveyed by the enlarged uterus. The outlines of a fœtus could be felt through the abdominal walls. The percussion note was resonant anteriorly and on each side as far as the lumbar region. Fluid could be detected in the abdominal cavity.

Per vaginam the os uteri was found to be about two-thirds dilated ; the posterior part could readily be felt, but the anterior part could not be detected. The head of the child could be reached with difficulty, as it was very high up and pushed forwards on the pubis by the last lumbar vertebra, which projected very much downwards and forwards. The withdrawal of the examining finger was accompanied by a profuse discharge of blood.

From this history I think one may justly conclude that the uterus was ruptured at least twenty-six hours before the patient's admission to hospital. In consultation with Drs. Kidd and Corley, it was agreed that the only possible way of saving the woman's life was to perform abdominal section and remove the fœtus. Accordingly, the patient having been put under the influence of ether, an incision was made from one inch below the umbilicus to one inch above the pubis ; the abdominal walls were then completely divided, and when the peritoneum was opened a large quantity of stinking gas escaped. The child was found lying in the front of the abdominal cavity, and was easily extracted by making traction on the lower extremities, pressure being kept up on each side in order to prevent protrusion of the intestines. On tracing the cord backwards the placenta was found lying in the right lumbar region surrounded by a large quantity of blood and meconium. The uterus was next found lying in the back of the abdomen, small, hard, and well contracted, and in the lower part of it was situated a longitudinal tear, about three inches long, extending from the ring of Bandl downwards to the vaginal portion of the cervix, the body of uterus being intact. As the lips of the tear were almost gangrenous, very much everted and gaping, and as a fibroid was attached to the upper part of the uterus, the entire removal of the organ was considered necessary. A transfixion needle was passed through the upper part of the cervix, and the uterus directly above it was

enclosed in a Keith's clamp and then separated with a scissors, the vessels in the face of the stump being secured with ligatures, a drainage-tube being left in the lower angle of the wound, which (all blood, &c., having been removed from the peritoneal cavity) was closed with sutures and the usual dressings—viz., protective strips of plaister and gauze.

The patient rallied well after the operation ; the face, to a great extent, lost the worn, pinched look ; the surface of the body became warm and the pulse considerably improved—insomuch that at seven o'clock on the morning after operation it was 100 per minute and of fair volume, there being no vomiting throughout the night.

At 10 a.m. she suddenly vomited a large quantity of greenish fluid, and rapidly died, almost eleven hours after the operation.

Post mortem twelve hours after death.—Signs of recent and extensive peritonitis were found in the abdominal cavity. The portion of uterus enclosed in the clamp was torn completely through to the lower extremity of the anterior lip of the cervix ; the bladder was uninjured. The pelvis was that described as the lateral oblique pelvis of Nægelé, complicated by projection downwards and forwards of the last lumbar vertebra—spondylolithesis.

I believe the first thing that will strike any of us in considering this case is a sense of wonder and regret that any woman should be allowed to remain so long in labour without any attempt being made to deliver her, and still more, that after the symptoms of rupture of the uterus had appeared during the afternoon of Thursday the 4th of November, the woman was, practically speaking, left to die.

I do not think anything particular can be said of the laceration itself ; it was of the ordinary type which occurs during labour, the ætiology of which has been so well described by Bandl.

Concerning the treatment, I consider that no other course was open to us, as the small size of the pelvis would have rendered any attempt at delivery per vaginam utterly impossible. As to the propriety of removing the uterus after the manner of Porro, or of stitching up the uterine wound by Sanger's method, I think one must be very much guided by the nature of each case—viz., when a lengthened period has elapsed after the tear has taken place, when the lips of the uterine wound are gaping and everted,

and when the placenta is adherent to the upper part of the uterus, as has been recorded in some cases—then I believe Porro's operation should be preferred; but in other cases I believe Sanger's would be the better operation, as it should cause less shock to the patient. Unfortunately, the mortality of Porro's operation, in cases of rupture of the uterus, has been very great, as of eight cases mentioned in the last number of the *American Obstetrical Journal,* only one patient recovered; while in the June number of the same journal there is recorded an interesting case of traumatic rupture of the uterus during the eighth month of pregnancy, with escape of the fœtus into the abdominal cavity, the placenta remaining in the uterus. Laparotomy was performed and the fœtus and placenta removed, the uterine rupture being closed by silk sutures. The patient subsequently recovered.

In spite of the great mortality attending abdominal section for the removal of fœtus and placenta after rupture of the uterus has taken place, I believe that it would not be justifiable in these cases to attempt delivery by drawing the child back into the uterus and delivering per vaginam, as the risk of inflicting additional injury on the uterus and of drawing down the intestines is very great; besides, it would be altogether impossible to remove blood, &c., from the peritoneum.

REMOVAL OF BOTH OVARIES FOR MASTUR-BATION AND INSANITY.

By WILLIAM K. M'MORDIE, M.D.;

Surgeon to Samaritan Hospital for Women and Children, Belfast.

S. J., aged thirty-three, married thirteen years and the mother of six children, accompanied by her family surgeon, Dr. Given, of Omagh, consulted me on August 23, 1886. She had previously been confined in an asylum for the insane for some time. She was a confirmed masturbator, and performed the act quite regardless of the presence of other people—even in the presence of her husband and children. After each performance she suffered from a paroxysm of excitement, followed by despondency. She stated she was quite unable to give up the habit. I advised the removal of the ovaries, as giving, in my opinion, the only hope of a cure for the pernicious habit. I also held out a hope that the operation might result in permanent benefit to her mental condition. In this opinion Dr. Given concurred. I fully explained the nature of the operation both to the woman and her husband. Bichloride of methylene having been administered, assisted by Dr. Walton Browne and Dr. Given, I performed the operation on August 26th. I made the incision about two and a half inches in the median line, commencing about one inch above the symphysis pubis. The abdominal wall was very thin, and the skin loose and wrinkled. This condition caused the completion of the incision to be somewhat tedious. Having drawn out each ovary I ligatured about one inch from the ovary with strong silk, using the Staffordshire knot described by Dr. Tait. I closed up with silver sutures. I operated under the carbolic spray, and used antiseptic dressings. She recovered from the operation without a bad symptom, the

wound healing by primary adhesion. She returned home on September 15th, when her mental condition was much improved from what it was on her admission to the Samaritan Hospital. After the operation she only once attempted to interfere with her person. On December 9th her husband wrote:—" Her mind is not much improved, but she never interferes with herself." The woman stated she had contracted the habit of masturbation long before her mind was affected. In the left ovary was a small cyst, about the size of a hazel nut, filled with a thin dark-coloured fluid.

ON THE REPARATIVE TREATMENT OF SOME OF THE GRAVER FORMS OF VESICO-VAGINAL FISTULA.

By THOMAS MORE MADDEN, M.D., F.R.C.S. Edin. ;

Obstetric Physician, Mater Misericordiæ Hospital;
Consultant Obstetrician, National Lying-in Hospital.

NOTWITHSTANDING the great advance of modern gynæcology, in no respect better shown than in the operative procedures by which vaginal fistulæ have been so generally amenable to reparative treatment, the management of such cases in some exceptional instances still presents one of the most difficult problems that may occur in our special line of practice.

On the present occasion I do not purpose to refer to the ordinary forms of vaginal fistulæ consequent on parturition, which are now less frequently met with as well as more amenable to ordinary operative treatment than was formerly the case. I shall, therefore, now confine myself to those graver as well as more exceptional cases in which more difficult procedures must be resorted to.

These cases may, I think, be roughly divided into two categories—firstly, those which, although some considerable loss of tissue has resulted from sloughing of the vesico-vaginal walls, are capable of repair by measures having for their object the bringing together and maintaining in apposition the separated parts until firmly consolidated by adhesive inflammation. In the second class may be included all cases in which the loss of substance or the position and character of the rupture are such as to preclude the restoration of the former structural integrity of the parts, and where either, by plastic operation, new vesico-vaginal or vesico-uterine walls must be built up, or else a new condition of the injured parts must be established.

With regard to the first class of cases, or where some degree of sloughing has followed long compression from delay in the second stage of labour, the main trouble in the operative treatment consists in keeping together the surfaces included in the sutures until they become united by new connective tissue, and in over-coming or preventing the disturbing influence of the retractile tension occasioned by the muscular structures of the vesico-vaginal walls, and the tendency to separation occasioned by their natural mobility. I need not here refer to the various mechanical experi-ments which have been designed for this purpose, as they are well known to the Academy; and, moreover, in the majority of instances, they are either unnecessary or useless, as their object may be generally accomplished by the division of any specially tense bands, or by merely nicking these at short intervals with the scalpel so as to allow them free expansion. In some few instances, however, I have found it necessary to employ the little instrument now shown, which is merely a modification of the late Mr. Baker-Brown's bar-splint for the purpose of lessening the tension on the sutures, and so hold the edges of the wound securely together.

Vesico-Uterine Fistulæ, if of less frequent occurrence, are obviously of greater importance and present much greater difficulties in their reparative treatment than those already referred to. In the com-paratively exceptional cases of this kind that have come under my notice in hospital, in almost every instance the patient had been delivered instrumentally. Moreover, they most commonly occur in patients who have had a number of children, and who conse-quently have the abdominal parietes relaxed and the uterine walls softened and disintegrated by imperfect involution. In some instances they originate in lacerations of the cervix, extending thence across the roof of the anterior vaginal *cul-de-sac* into the bladder. And in such cases it is obvious that, even should the cervical laceration be healed over from below in the ordinary way, a fistulous communication would still remain above between the bladder and the uterine cavity or cervical canal, which must be subsequently dealt with.

Under these circumstances, therefore, we must either resort to

tracheloraphy in the first instance, followed by a plastic operation on the vesico-uterine rent, or close the os uteri, so as to convert this organ into an appendix to the bladder, through which the patient will afterwards menstruate, or else obtain a similar result by turning the cervix into the vesical cavity by the operation recommended by Dr. Goodell in some cases of this kind, which may be accomplished by denuding a portion of the cervical surface and uniting it to the vivified free edge of the fistulous opening. As a rule, neither of the latter operations should be resorted to whenever the former can be successfully performed, as their result should apparently be to render the patient capable of future gestation. In one remarkable case of this kind, however, in which Dr. Goodell's operation was anticipated by the late Dr. M'Clintock, the normal aperture of the uterus being thus closed, nevertheless the patient afterwards again became pregnant, as it would appear, through the urethra.

In cases of complete destruction of the anterior wall of the vagina, involving the entire vesico-vaginal septum from the urethra to the base of the bladder, gynæcologists were formerly content to palliate the miserable condition of the patient by mechanical contrivances, such as a well-adjusted urinal belt. Recent experience has, however, demonstrated the feasibility of affording complete relief from the incontinence of urine in such cases by denuding the internal labial surfaces, and then closing them by sutures, so as to leave only a small aperture for the passage of urine, which can, if necessary, be controlled by a properly adjusted spring trap or pad, and which, as will be seen by the following case, may not even require this. The advisability of such an operation in any instance is, however, another and a very difficult question, and most certainly it should never be undertaken without absolute necessity and after full consideration of all the possible consequences of converting the vaginal canal into a receptacle for urine—a condition entirely foreign to its physiological purpose, and one liable to be productive of grave ulterior results.

The objections to this operation have been very forcibly urged by one of the most eminent modern authorities on the subject; and

as one of the objects of the present communication is to bring forward a case where I succeeded in relieving an otherwise incurable patient by the procedure thus condemned, I shall here, in the first place, recapitulate Dr. Emmet's views on this point :—" There exists," he says, " no greater malpractice than the procedure which, we are told, was practised by that great master, the late Professor Simon, of Heidelberg. He never seemed to appreciate the importance of the principle which I am now endeavouring to impress upon the reader. Without hesitation he would shut up the vagina when difficulties presented themselves in bringing together the edges of a fistula, as if the sole object was to give a retentive power regardless of the consequences. From my own observation I have learned that it is but a question of a few months, a year, or possibly two, before serious consequences must arise after leaving a receptacle, like a portion of the vagina, in which the urine may stagnate. To give a retentive power for so short a time is not a sufficient compensation for the suffering and consequences which supervene. As the result of my experience, I would urge that the operation should never be resorted to under any circumstances. The maximum has now been reduced to two or three per cent. of cases where the resources of the surgeon cannot overcome all the difficulties which may be presented in closing a vesico-vaginal fistula. Something more may be accomplished in the future ; but, at present, these incurable cases are better without the retentive power when gained by Simon's method. The surgeon endeavours to cause the parts to heal thoroughly, and educate the patient in the art of taking care of herself, and in this way much can be done to render her condition a comfortable one."

When the destruction of tissues has been so extensive as to permit the inverted bladder, filled with intestines, to protrude from the labia in an almost strangulated condition, some surgical relief is imperative. In such cases I do not hesitate, with the consent of the husband, to unite the sides of the vagina at any point within the canal at which I can gain the needed support for the bladder. This is done to relieve the suffering attendant upon the prolapsed bladder, and it is very effectual. But I always leave an opening

at the most dependent portion, and one above, so that the urine cannot accumulate, and the parts may at any time be washed out if necessary. After the surfaces have all healed, and the woman has learned to keep herself free from excoriations, her health will remain good, and the escape of the urine will be comparatively but a slight inconvenience. Certainly no comparison can be drawn between the comfort of one with retentive power at the cost of cystitis and its consequences, and the other in a healthy condition, with the urine escaping into a cloth or some other suitable receptacle.

For my own part I would say that it should not be forgotten in this connection that in some instances vesico-vaginal fistula of large extent may possibly be cured spontaneously or without any operative interference. I myself am cognisant of two such cases, in which the patients, in early life, had each suffered parturient laceration of the vesico-vaginal walls, and for many years subsequently endured the incontinence of urine and other discomforts consequent thereon. In both cases, in the course of time, these patients by the occurrence of senile atresia of the vagina at last became perfectly freed from any trace of the accident, the effects of which had rendered miserable the better part of their long lives. Such cases are, however, far too exceptional to have much practical influence in determining the adoption or non-adoption of any available plan of treatment in cases of vesico-vaginal fistula, such as the following. In this instance the ordinary method of treatment failed; and as the operation employed, although, perhaps, neither original in its conception nor approved by the highest authority, was successful, and is not often, if ever, here resorted to, I have thought its details might be worth bringing before the Academy :—

CASE.—K. B., aged forty, widow, six children, sent in by Dr. O'Brien, Johnstown Bridge; admitted November 12th, suffering from vesico-vaginal fistula and laceration of cervix of four years' standing. She was in a wretchedly cachectic state; her thighs and nates raw and excoriated by the constant urinary dribble, and thickly encrusted with sabulous deposit. The history of the case,

as well as it could be ascertained—as she was an extremely stupid woman—was that until the birth of her last child she had enjoyed good health. Her labour was very protracted, extending, according to her own account, over sixty-nine hours, but she had no assistance beyond that of a neighbourly "handy woman." She states that the incontinence of urine was first noticed the day after delivery, but became much worse when she arose from bed, six days later, and had since continued. She sought no advice, however, until a month before admission, when she consulted Dr. O'Brien, by whom she was sent up to hospital. On examination the cervix was found extensively lacerated bilaterally, the rent extending from the anterior lip of the vaginal roof and down through the septum, and involving the entire of the base of the bladder. There was considerable loss of substance, apparently from sloughing. A few days after admission an attempt was made to close this large opening, in the usual manner; and with great difficulty, owing to the loss of tissue, its vivified edges were brought together. Unfortunately, however, although some union took place in the lower part of the wound, no substantial benefit followed this operation ; and, hence, considering that under the existing local circumstances and general condition of the patient, any further effort in the same direction would be equally unavailing, when she again returned (three months later) I resolved on trying a modification of Simon's operation for closing the vaginal aperture so as to form a new receptacle for the urine. With this view a superficial incision was cautiously made, extending elliptically through the vaginal mucous membrane from above the meatus anteriorly round the canal to its posterior commissure behind the nymphæ, and thence dissected off the subjacent structures and removed, so as to leave an extensive raw surface. A great deal of venous hæmorrhage took place during this, which was arrested by hot water and turpentine, whilst a few small, spouting, arterial branches were twisted or ligatured. When all hæmorrhage had been thus arrested the denuded surfaces were brought together by silver wire sutures, so as to completely close the passage from the vaginal orifice upwards. The vulva was sealed with aseptic dressing, leaving merely an opening for the retaining catheter, and secured by a pad and a bandage. On the next day she complained a good deal of pain and soreness, which was relieved by opiates, but beyond this her recovery was uninterrupted, the temperature never rising above 100°. The catheter, being a railroad one, was changed and cleaned

daily, without disturbing the dressing, until the eighth day, when the sutures were removed and the parts found united. Her bowels were then cleared by an enema, the vulval dressing replaced, and the catheter continued for another week, at the end of which it was finally withdrawn, and she was then found to have complete retentive power in the recumbent position, though when standing there was still a slight dribble from the dilated urethra, which gradually lessened, and after leaving the hospital I heard that she had no vestige of this trouble, from which she remained free until her death, from fever, eighteen months later.

In conclusion I may repeat that, whilst regarding my modification of Simon's operation for closure of the vagina merely as a *dernier ressort*, to be adopted only in the treatment of some exceptional cases of vesico-vaginal fistula otherwise incurable, nevertheless this procedure appears to me well deserving of consideration in such cases. I yield to no one in my respect for Dr. Emmet's authority on this subject, but I would not myself be deterred even by his condemnation from again reverting in any similar instance to the operation by which I benefited the patient whose case has been just related. Whether any renal disease, such as Dr. Emmet insists on as a consequence of Simon's operation, supervened in my case or not, I have no data to say. I only know that a patient whose condition had for years previously been as miserable as any that could well befall a woman, and who to the best of my opinion was otherwise incurable, was by the operation described restored to a state of comfort and apparent health (which lasted for at least some time) subsequently.

ABSCESS OF THE UTERUS OPENING AT THE UMBILICUS.

By J. RUTHERFORD KIRKPATRICK, M.D. Dub., F.K.Q.C.P.;

King's Professor of Midwifery ;
Obstetric Physician to Sir Patrick Dun's Hospital.

[Read in the Obstetrical Section, May 6, 1887.]

I WISH to bring the following case before this Section of the Academy of Medicine, in order to place on record an account of a rare form of disease, and also to elicit the criticism of the members as to the correctness of the diagnosis and the mode of treatment.

CASE.—Norah M'C., aged twenty-two, married, was admitted to Sir Patrick Dun's Hospital, under my care, on the 4th January, 1887.

She had been confined of her second child on the 1st of December last. One of the maternity nurses of the hospital had charge of her during her delivery, and for nine days following.

There was nothing unusual about her labour, except that it was rather prolonged, owing to inertia. Previously to her confinement she had been in a weak and delicate state, not able to go about much. Subsequently, also, she remained weak, and did not get back her strength, but had not suffered from any attack of acute pain, or symptoms of inflammation, with the exception of pain in passing water. About the 21st of December she first noticed a swelling in the abdomen, her attention having been directed to it by finding a difficulty in fastening her stays ; and, fearing she was getting dropsy, she applied for advice at the dispensary, Grand Canal-street, from whence she was sent into hospital.

On examination of the abdomen, a tumour was found, extending from the pubis to about an inch above the umbilicus, in shape and size corresponding to the uterus, when about six or seven months pregnant.

The tumour on palpation had a firm elastic feel; was slightly movable from side to side; was not painful on pressure, except at the upper part round the navel, extending over a circle about three inches in diameter. Laterally and above the tumour the abdomen was soft and flaccid, clear on percussion, and free from pain. On making a vaginal examination, the cervix uteri was found rather high up; not displaced in any direction; movable; no pelvic exudation either in the posterior *cul-de-sac* or laterally. Bimanual examination showed that the tumour was continuous with the uterus, which was enlarged from just above the cervix, but was not painful to the touch.

There was no vaginal discharge either then or subsequently. The lochia had been very scanty, and there had been no *post-partum* hæmorrhage; the bowels were constipated; the urine normal, and passed without pain or difficulty. The sound, which was passed carefully and easily into the uterus, showed the internal measurement to be upwards of six inches; but, for obvious reasons, I did not use the sound again.

She suffered from sleeplessness; loss of appetite; the tongue was white, but not dry; had not had any distinct rigor, but felt chilly very often.

The pulse, on admission, was 115, and I never found it below that rate for many weeks. The temperature in axilla 100°, with an evening rise, generally varying from 102° to 104°, and continuing so till the 8th of March, as will be seen by the chart (p. 222). There was very little change in any symptom for many days after admission.

Treatment.—The external application of glycerine of belladonna with iodide of potassium ointment, and linseed poultice. Mild purgative medicine acted better and caused less pain than an enema, which she always dreaded. Internally, quinine and opium in pill, and iodide of potassium in mixture, and anodyne draughts at bed-time.

The upper part of the tumour was evidently adherent to the abdominal wall round the umbilicus where the chief seat of pain had been.

On the 29th of January the umbilicus was found, on examination, bulging out about the size of a pigeon's egg, red, and fluctuating. It was arranged to open it the next day under the carbolic spray. However, during the night, a very slight discharge of pus took place, and the umbilical protrusion subsided, and everything

went on as before till the 7th February, when the umbilicus again filled up and protruded during that night ; about two or three ounces of pus were discharged.   A slight discharge continued now day by day.

On the 11th of February my colleague, Dr. Bennett, who kindly assisted me in the treatment, introduced, by means of a probe, a small-sized drainage-tube through the opening in the umbilicus, passing it in about two inches.

A dressing of iodoform ointment covered with salicylic wool was applied over the abdomen.

The matter discharged at the umbilical opening was generally a thick putty-like substance, and could be pressed out in great quantities ; it consisted of fatty-like matter and pus.

On the 3rd of March Dr. Bennett introduced a larger drainage-tube, through which, and alongside of it, the discharge continued to come.

On the 4th of March the patient had not slept at night, and complained of acute pain in the left knee and forefinger on the left hand, over both of which places there was a blush of inflammation, indicating symptoms of pyæmia.   The discharge was fœtid and thinner than before.

The abscess cavity was to-day irrigated with a solution of boracic acid (1 oz. to 40 ozs. of hot water) by means of a flexible tube passed in at the umbilical opening. The daily dressing and cleansing of the abdomen externally, removal of the drainage-tube, irrigation of the abscess cavity, and re-introduction of drainage-tube were conducted under carbolic spray.   The drainage-tube and external parts washed with a solution of bichloride of mercury, 1 to 2,000.   Lint spread with iodoform ointment placed over entrance of tube ; salicylic wool over abdomen, retained by a roller round the body.

Notwithstanding all these precautions, the discharge continued for several days horribly fœtid ; at the same time the patient was attacked with profuse diarrhœa, but no pus could be detected in the motions.

Her state of weakness was extreme, and a favourable issue seemed almost hopeless.   The same treatment was continued day by day, on the 4th, 5th, 6th, and 7th of March.

The report on the 8th of March is as follows :—Patient slept very well last night ; her temperature is normal to-day ; the pulse 98 ; the abscess cavity was irrigated again to-day.

The report on the 9th, 10th, 11th, and 12th, continue favourable. The fœtid odour of discharge disappeared; the putty-like matter ceased; the irrigation fluid returned quite clear from the abscess cavity; temperature sub-normal; pulse 68.

Report of the 14th March:—Patient slept well; the drainage-tube came out during the night, and was not again replaced; wound dressed with iodoform ointment, salicylic wool, &c.; no discharge; pulse 70, and temperature normal.

The size of the tumour had much diminished, and the umbilical opening closed. On the 18th March the patient was allowed up for the first time.

She left hospital on the 22nd of March. I have seen and examined her several times since, Tuesday, 3rd May, being the last occasion. She feels quite well; the abdomen soft and flaccid; no tenderness on pressure; all trace of tumour disappeared; the uterus is normally situated, freely movable; no thickening in surrounding tissue; menstruation had just ceased, having taken place for the first time since her confinement, continued for eight days, and was unaccompanied by pain.

There are many points of great interest in this case—

1st. The sudden appearance of the abdominal tumour, not preceded by any well-marked inflammatory attack during the puerperal period.

2nd. The absence of any change in the symptoms for six weeks.

3rd. The safe and satisfactory road of exit taken by the abscess, adhesive inflammation having taken place between the upper part of the tumour and abdominal wall at the umbilicus.

4th. The quantity and character of the putty-like discharge.

5th. The grave symptoms of threatened pyæmia.

6th. The marked improvement following the irrigation of the abscess cavity after the first four or five days; the cessation of the fœtor; the fall in the temperature from 104° to normal; the fall in the pulse from 120 to 70.

7th. The satisfactory result in the complete recovery of the patient, and disappearance of the tumour.

I have described the above as a case of abscess of the uterus opening at the umbilicus. My reason for doing so is that I have not been able to find in any of the authorities to which I have had

access any case at all similar, except in Vol. X. of "Ziemssen's Cyclopædia of the Practice of Medicine." The late Professor Schroeder, writing under the head of Acute Metritis, at page 98, says :—"The termination in the formation of an abscess is unusual. The abscess may become caseous, although this occurrence is, of course, rare. . . . Not infrequently, however, after agglutination has taken place, it breaks into the rectum or through the abdominal wall. . . . I have myself seen (he says) two instances of large uterine abscesses, of which one, represented in Fig. 40, had formed during puerperal convalescence. After artificial separation of the placenta, when the abscess was near perforating through the adherent abdominal wall, it was opened by the attending physician, and discharged about a pint of pus. . . . By conjoint manipulation we ascertain the marked enlargement of the uterus, particularly in its antero-posterior diameter, and its sensitiveness, which is not confined to the peritoneal envelope alone. . . . Both these symptoms, together with the fever and course of the disease (gradual detumescence of the uterus), render the diagnosis sufficiently certain. The sound should not be introduced, because it greatly increases the pain and inflammation. . . . Larger collections of pus, however, are easily recognised when it is possible to watch the slow, but sure, uniform increase of size of the uterus, and feel the fluctuation, or, at least, the firm elasticity, produced by an accumulation of fluid. The adhesion of the enlarged uterus to the abdominal wall, when the abscess is on the point of perforating the latter, favours the supposition of the presence of pus. The sensitiveness of the uterus, moreover, when enlarged by an abscess, is but slight."

The remarks of Professor Schroeder, which I have quoted, and Fig. 40, at page 99, correspond so very closely to the case I have brought before the Obstetric Section this evening that I have thought it well to introduce them at the close of this paper. I cannot sit down without expressing my sense of the valuable assistance of Dr. Bennett in the management of this case.

CHART OF TEMPERATURE, &C.

Name, Norah M'C.; *Age,* 22; *Disease,* Abscess of Uterus; *Result,* Recovery.

REPORT OF THE ROTUNDA HOSPITAL FOR THE THREE YEARS ENDING 3RD NOVEMBER, 1886.

By JOHN LILLY LANE, B.A., L.K.Q.C.P. & L.R.C.S.;
Ex-Assistant-Physician.

THROUGH the kindness of our President, I have the honour to lay before the Academy the Report of the Rotunda Hospital for the three years ending the 3rd November, 1886.

It was after considerable hesitation I accepted his kind offer, feeling keenly how imperfect my efforts to frame a Report worthy of the institution would prove, and how unfavourably my Report would contrast with those brought before you on former occasions by the Masters of the Hospital.

I have only had the good fortune to hear one of those Reports read—namely, that so ably brought before you by Dr. Macan, the present Master, which I feel certain is still fresh in the memory of many present; and I shall endeavour to inform you of the results since obtained in the hospital by the adoption of the measures and precautions he then advocated.

For the past three years the corrosive sublimate solution for the hands and for intra-uterine injection has been much more freely used, and indeed has almost entirely taken the place of the carbolic acid solution, except in cases of considerable hæmorrhage, suspected renal mischief, or great corpulence, and the reason of the continued use of the carbolic acid solution in these cases is that absorption being so great there is danger of mercurial poisoning manifesting itself by diarrhœa, tenesmus, bloody stools, &c., whereas by using the carbolic acid solution (1 in 80) no bad symptoms have been noticed.

The general use of the evaporation of carbolic acid solution in the wards, mentioned by Dr. Macan in his Report, has been discontinued, although had recourse to on one occasion when there were some unsatisfactory cases in the hospital.

Iodoform pessaries have not recently been employed nearly so frequently, and are now only used when the lochial discharge becomes fœtid, and continues so after the first washing out of the uterus.

I may here conveniently allude to the use of the napkins which were introduced by Dr. Macan. At first they did very well, and kept the beds much more cleanly, but after some time the temperature and pulse of some of the patients went up, for which we could not account, unless it were due to the use of the napkins—there being always considerable difficulty in getting them properly washed.

It was then decided that the first napkin used in each case should be soaked in corrosive sublimate solution, and wrung out before being applied to the vulva—the napkins, after the first in each case, not being put in the solution. This, at first, seemed successful, but at present only one napkin, soaked in solution, is used for each case.

During the three years there were 3,414 patients attended in the hospital, including 12 cases of threatened abortion. The following table (A) contains all cases that possessed any unusual interest, and in calculating the percentages I deducted these 12 cases.

There were 43 deaths from various causes, giving a mortality of 1·25 per cent., or 1 patient in 79·39. One of these deaths occurred from supposed acute yellow atrophy of the liver, about a week after the patient left the hospital, which she did contrary to the wishes of the staff; and another from septicæmia, the day after the patient went home, which she also did contrary to the wishes of the staff.

I have not thought proper to include in the list of fatal cases a patient confined in the hospital who had been sent in by Dr. Horne, suffering from a tumour complicating pregnancy. In this case there was at first considerable difficulty in arriving at a diagnosis, but after some time a tumour formed in the posterior *cul-de-sac*, from which, on being opened, a quart of pus escaped. The patient

at one time, whilst in hospital, became maniacal, although in this respect she was fairly recovered before she left, which she did at her own and her husband's request. She unfortunately, some time after leaving hospital, got possession of a revolver, and shot herself, with fatal results.

Table A.

—	1883 and 1884	1884 and 1885	1885 and 1886	Total	Average
Forceps - - - -	68	65	70	203	1 in 16·75=5·96 per cent.
Version { Internal - -	8	8	11	27	} 1 „ 89·5 =1·1 „
Version { External - .	4	5	2	11	
Perforation - - -	5	4	8	17	
Induced labour - -	4	4	3	11	
Accidental hæmorrhage -	24	37	37	98	1 „ 34·71=2·88 „
Placenta prævia { Partialis -	2	3	9	14	} 1 „ 226·8=0·44 „
Placenta prævia { Centralis -	1	0	0	1	
Post partum hæmorrhage -	52	43	48	143	1 „ 23·72=4·2 „
Secondary post partum hæmorrhage - - -	3	5	6	14	1 „ 243·0=0·41 „
Transfusion - - -	0	0	3	3	
Adherent placenta - -	16	13	8	37	1 „ 91·95=1·08 „
Breech presentation - -	30	30	20	80	1 „ 42·52=2·35 „
Face ,, - -	4	3	6	13	1 „ 261·7=0·38 „
Brow ,, - -	0	1	0	1	
Transverse ,, - -	4	5	6	15	1 „ 226·8=0·44 „
Footling ,, - -	3	17	12	32	1 „ 106·3=0·94 „
Prolapse of funis - -	8	16	8	32	1 „ 106·3=0·94 „
Face to P. - - -	8	14	5	27	
Abortion and premature labour	76	64	63	203	
Threatened abortion - -	2	6	4	12	
Myxoma of chorion - -	0	0	4	4	
Twins - - - -	18	23	13	54	1 „ 63·0 =1·58 „
Triplets - - - -	1	0	1	2	
Umbilical hernia - -	0	1	0	1	
Convulsions - - -	3	4	6	13	
Mania - - - -	5	5	6	16	
Fibroids complicating pregnancy - - -	0	2	2	4	
Ovarian tumour complicating pregnancy - -	0	1	0	1	
Occlusion of vagina - -	0	1	0	1	
Abscess in posterior cul-de-sac with pregnancy - -	0	0	1	1	
Hydrocephalus - - -	0	0	1	1	
Prolapse of uterus before delivery - - -	0	1	2	3	
Thrombus of labium after delivery	0	1	0	1	
Erythema - - -	12	3	10	25	
Spina bifida - - -	2	2	1	5	
Anencephalous fœtus - -	0	3	0	3	
Ophthalmia neonatorum -	14	9	11	34	1 „ 100·05=0·99 „

Perchloride of iron injected in 12 cases.

P

The following is a summary of the fatal cases :—

CASE I.—M. C., aged twenty-four, third pregnancy, admitted 29th November, 1883, in a state of partial collapse from accidental hæmorrhage. Stimulants and beef-tea administered, also ergot; hæmorrhage ceased, and patient improved somewhat; uterine contractions also improved; patient delivered herself a few hours later; placenta expelled in twenty minutes, followed by a gush of blood; uterus relaxed; ergot again given and hot douche used—this not checking the hæmorrhage, uterus injected with perchloride of iron, which stopped the hæmorrhage—but though every means was tried, the woman gradually sank and died. There was no *post mortem.*

CASE II.—E. M., aged thirty-three, seventh pregnancy, admitted 27th November, 1883, in a very bad state of health, having been an inmate of Steevens' Hospital a few weeks previously with cough and spitting of blood; delivered herself 27th November, but died fourteen days after of phthisis. Dr. James Little had seen the patient and agreed in the diagnosis.

CASE III.—C. C., aged twenty-nine, sixth pregnancy, admitted to hospital 25th January, 1884, but labour not having commenced was transferred to Auxiliary, as she was suffering from a cough, dyspnœa, dysphagia, and vomiting of ropy mucus and coffee-ground looking stuff; improved somewhat, and was suddenly delivered on night of 30th; the day following there was very little vomiting, but respiration was more difficult, and patient became cyanosed, and died that evening, twenty-four hours after delivery. *Post mortem.*—Acute bronchitis with enlargement of bronchial glands, also an old ulcer of stomach.

CASE IV.—K. H., aged twenty-seven, first pregnancy, admitted 28th January, 1884; delivered with forceps on the 29th of an 8 lbs. child. Liquor amnii had been coming away for five days before admission. Died, 6th February, of septicæmia. No *post mortem.*

CASE V.—A. G., aged nineteen, first pregnancy, admitted 8th March, 1884; delivered same day of a premature child, dead and macerated. Uterus washed out with antiseptic solution. This woman was quite jaundiced when admitted, and had been for a week previously. Died 11th March. *Post mortem*, by Dr. Duffey, verified the diagnosis formed of acute yellow atrophy of liver.

Case VI.—E. D., aged twenty-five, third pregnancy, sent to Rotunda by Dr. Neary of Howth ; when admitted was excited and talkative, speaking about her home and wondering where she was. Delivered 18th April, 1884. Died twenty-four hours after. *Post mortem* by Dr. Duffey.—Tuberculosis of lungs and brain with œdema pulmonum.

Case VII.—C. K., aged twenty-eight, seventh pregnancy, sent to hospital by the clinical clerk, 30th April, 1884, suffering from accidental hæmorrhage, which first came on two days before admission, but ceased till the day she was seen. The membranes were ruptured at 9 a.m., 30th ; child born in twenty minutes after ; got rigor at 2 p.m. ; greenish vomit, and complained of severe abdominal pain. Died, 1st May, of septic peritonitis.

Case VIII.—J. S., aged twenty-three, fifth pregnancy, admitted 17th June, 1884 ; delivered the 18th, after a rather tedious labour ; was transferred to Auxiliary 25th ; and died, 2nd July, of pyæmia. *Post mortem* by Dr. Duffey.—Acute ulcerative endocarditis.

Case IX.—M. C., aged twenty-eight, third pregnancy, brought to hospital, night of 8th August, 1884, by the clinical clerk. Patient was very emaciated ; had been confined to bed for two and a half months, and dispensary doctor said " both her lungs were gone ;" was seven months pregnant. Stimulants administered, and, as she was in labour, membranes were ruptured ; delivery effected by natural efforts 9th August, but she died eight hours after of exhaustion from phthisis. No *post mortem*.

Case X.—R. D., aged twenty-nine, sixth pregnancy, brought to hospital, 20th November, 1884, in a state of coma from convulsions. When undressed, child found born as far as umbilicus ; no difficulty in delivering arms and head ; premature, eight months. Adherent placenta removed. Died, evening of admission, 15 hours after first convulsion. No *post mortem*.

Case XI.—B. C., first pregnancy, admitted 24th November, 1884, and delivered same day by natural efforts ; face presentation. This patient was examined by a student who had not washed his hands after having examined a labour case with fœtid discharge (who also died of septicæmia). Died, 1st December, of asthenia and puerperal peritonitis. No *post mortem*.

Case XII.—A. W., aged twenty-four, first pregnancy, admitted 24th November, 1884 ; delivered with forceps same day. Child

dead and œdematous. Placenta adherent removed, when it, together with the discharge, was found to have a very fœtid smell; slight *post-partum* hæmorrhage. Died, 6th December, of septicæmia. We considered that it was from this case the preceding one was poisoned.

Case XIII.—B. T., aged thirty, third pregnancy; admitted from Auxiliary, 11th December, 1884, having been sent up from the country. Delivered 12th December. Died 15th December, of septicæmia. No *post mortem.* This woman's child died quite suddenly 24 hours after its birth.

Case XIV.—W. L., aged twenty, third pregnancy; admitted 4th January, 1885; delivered the 5th of a still-born child, not macerated. Uterus was not washed out. Died 15th January, of asthenia from puerperal peritonitis. No *post mortem.*

Case XV.—E. R., aged twenty-eight, second pregnancy; admitted 15th January, 1885, at 1 a.m.; delivered a few minutes afterwards. Stated that three days previously she had been attacked with shivering and great pain in back (inferior angle of right scapula), also had troublesome cough. In about seven hours after delivery her pulse was 140, and temperature 103° F. Became maniacal a couple of days later, and died rather suddenly 19th January. *Post mortem.*—Congestion of lungs. This woman, it was afterwards ascertained, had been a great drinker.

Case XVI.—H. C., aged nineteen, first pregnancy; admitted 13th January, 1885. Hydrocephalic child, diagnosed by external palpation. Labour had commenced, and in about 20 hours after admission her pulse was found to be 140, and temperature 102·4° F. Membranes were then ruptured, when a large quantity of liquor amnii escaped. A few hours later, child's head was aspirated, and about 40 oz. of fluid drawn off. Forceps were then applied, and patient delivered. Child was dead, had a spina bifida, and left arm amputated in utero. Died 21st January, having become rather jaundiced. *Post mortem.*—Pleuro-pneumonia.

Case XVII.—M. A. H., aged thirty-three, fifth pregnancy; admitted 27th January, 1885, suffering from severe accidental hæmorrhage; os rather small; ergot and stimulants given by mouth. The membranes were ruptured, and afterwards version performed. Child extracted, and placenta followed head; slight P. P. H.; iron

injected, and, although hæmorrhage ceased, patient gradually sank. No *post mortem.*

Case XVIII.—M. C., aged thirty-four, second pregnancy; sent to hospital, 13th February, 1885, by Doctor Colgan, of Bagnalstown, Co. Carlow, pregnancy being complicated by an ovarian tumour. Labour induced. Child extracted, March 18th, footling with prolapse of non-pulsating funis; head perforated, as there was some difficulty in its extraction. Patient's abdomen afterwards became greatly distended. Ovariotomy performed on seventh day, but she died 36 hours after of peritonitis. No *post mortem.*

Case XIX.—M. M., aged twenty-four, first pregnancy; admitted 1st March, 1885, in a bad state of health. Had been under treatment by Dr. Gibson, of Clontarf, for some time, as also her sister, for heart and lung disease. She was very anæmic. with œdema of legs and feet. Delivered day after admission of a premature child. Died six weeks after of pleuro-pneumonia. No *post mortem.*

Case XX.—M. H., aged twenty-eight, first pregnancy; admitted 2nd May, 1885. Pains commenced last day of April; os small and rigid; anasarca of legs; urine muddy and albuminous. Delivered with forceps, morning of the 5th. Died 17th May. *Post mortem* by Dr. Lentaigne—Pneumonia and Bright's disease.

Case XXI.—K. F., a nursetender in the hospital, aged twenty-one; first pregnancy. Suddenly got convulsions on evening of 5th June, 1885. Legs and feet were found to be very œdematous Urine contained blood, and on boiling two-thirds became solid. Was delivered with forceps; no hæmorrhage. Died next morning, never having regained consciousness. No *post mortem.*

Case XXII.—M. B., aged thirty-three, sixth pregnancy, admitted 25th July, 1885, when she stated she had had hæmorrhage for 14 days, but when examined there appeared to be scarcely any coming; placenta felt partially over os, membranes were therefore ruptured, there being a fœtid discharge later on, with rise of temperature and shivering. Forceps were applied and delivery effected with ease. Failing to express placenta after a considerable time, it was decided to introduce the hand into the uterus, for which purpose a few whiffs of chloroform were being given, but before she was under the influence of it she suddenly ceased to breathe, and all efforts failed to revive her. No *post mortem.*

CASE XXIII.—B. C., aged forty, thirteenth pregnancy, admitted 18th August, 1885, having a very pendulous abdomen. A large quantity of liquor amnii being diagnosed the membranes were ruptured. Patient had had bronchitis, and stated she had been unable to turn in bed on account of great tenderness of abdomen. Delivered by natural efforts day of admission, but in three days had green vomit, and in five days more a distinct tumour, dull and elastic, could be felt in middle line of abdomen. She had diarrhœa, with pus and blood in motions. There was considerable œdema of abdominal wall. Skin over tumour sloughed, and as patient was passing water the slough gave way and a quantity of brown, grumous, very fœtid, fluid escaped. Improved after that, and insisted on leaving hospital 3rd September, but sought readmission after some time, when skin was found to be excoriated from the profuse discharge and want of cleanliness. Died 23rd September. No *post mortem.*

CASE XXIV.—L. S., aged twenty-eight, private patient, third pregnancy, admitted 22nd October, 1885, having had considerable amount of accidental hæmorrhage, which stopped when patient put to bed. Hæmorrhage again set in 23rd, checked by ergot. Vomited on 24th, when there was a little more bleeding, and uterus contracting frequently that night; two fingers passed through os, and foot, which was presenting, brought down; funis, which was not pulsating, prolapsed; child extracted; no hæmorrhage. Some hours after retching came on, and patient sat up, when a gush of blood came and patient fainted; previously had complained of pain in cardiac region. Iron injected. No more hæmorrhage, but patient died of exhaustion 28th. No *post mortem.*

CASE XXV.—R. B., aged twenty-eight, second pregnancy, admitted 27th October, 1885, with retained placenta, having miscarried two days previously at her own home. Discharge was fœtid, on account of which the uterus was being douched out, when, profuse hæmorrhage came on. Fingers were passed into uterus to remove placenta, during which process the patient seemed to faint. Iron injected to stop hæmorrhage, and every means tried to revive her without effect. *Post mortem* by Dr. Lentaigne, who could find nothing wrong. Death supposed to be due to syncope.

CASE XXVI.—A. E., aged twenty-two, first pregnancy, admitted 31st October, 1885; delivered same day; died 9th November, 1885, of puerperal peritonitis. No *post mortem.*

Case XXVII.—T. L., aged twenty, first pregnancy, admitted 18th October, 1885; delivered 19th; breech presentation. Symptoms of cellulitis developed fifth day, and afterwards inflammation invaded peritoneum; died 10th November of puerperal peritonitis. No *post mortem*.

Case XXVIII.—M. H., aged twenty-four, first pregnancy, admitted 15th October, 1885; delivered 16th; died of exhaustion from pyæmia 15th November, 1885. No *post mortem*.

Case XXIX.—M. M., aged twenty-one, first pregnancy, admitted 13th November, 1885; delivered 14th; died 25th November of septicæmia.

Case XXX.—A. M'C., aged twenty-two, first pregnancy; admitted 7th December, 1885. Had been in hospital from 19th November till 23rd, as she had had some hæmorrhage, but as it ceased she would not remain any longer. Placenta prævia lateralis was diagnosed, and as the hæmorrhage was very bad, child's head was perforated, and delivery accomplished 8th December. There being some *post-partum* hæmorrhage, placenta, which was still attached to uterus, was removed, and iron injected. Died, 30th December, of exhaustion from pyæmia.

Case XXXI.—A. M'P., aged twenty-five; fifth pregnancy. Patient brought to hospital in a stupid and almost pulseless state, having been attended for fourteen days previously from the hospital for constant vomiting. Labour began evening, 25th December, 1885. There was some hæmorrhage, and placenta was felt at edge of os; membranes were therefore ruptured. Delivered at 1 30 a.m., 26th, of a premature child, and died 30th December, 1885. *Post mortem* by Dr. Lentaigne, who found there was hæmorrhage into stomach.

Case XXXII.—M. C., aged thirty-five, twelfth pregnancy; sent to Rotunda by Dr. Reede, of Carrickmacross, 2nd January, 1886, patient having had several miscarriages, and also because her legs and abdomen were very œdematous; there was excess of liquor amnii. The membranes were ruptured 7th January, when, with liquor amnii, a considerable amount of blood escaped. Labour acccmplished with but very little trouble, though child's head, neck, and body were very œdematous, and abdomen distended with ascitic-like fluid, which was tapped to endeavour to allow room for lungs to expand; heart was pulsating, but all efforts failed to

establish respiration. There was an enormous, fatty placenta. Patient died of asthenia from pyæmia, 20th January. No *post mortem.*

CASE XXXIII.—E. N., aged thirty-nine, ninth pregnancy, admitted 25th March, 1886, having had hæmorrhage for four months. When examined, placenta was felt, and the hæmorrhage being profuse the child was turned and extracted. The placenta, which was still attached, was removed immediately. Although there was not much *post-partum* hæmorrhage, as the woman was sinking, perchloride of iron was injected and transfusion of saline solution, but patient died in a very short time (25th March). No *post mortem.*

CASE XXXIV.—M. D., aged twenty-seven, private patient, second pregnancy; admitted 2nd March, 1885; delivered before she could be examined or properly undressed. Died of exhaustion, from pyæmia, 9th April, more than five weeks after delivery. No *post mortem.*

CASE XXXV.—M. F., aged forty, fifth pregnancy; admitted 19th May, 1886; delivered 20th. Died of septicæmia, 30th May, 1886. No *post mortem.*

CASE XXXVI.—E. K., aged seventeen, first pregnancy; admitted 30th April, 1886, in an unconscious state, from convulsions; urine, one-fourth albumen. Child born on 1st May. Consciousness returned 2nd May, became maniacal on 5th, and died 10th May, 1886. No *post mortem.*

CASE XXXVII.—E. J., aged twenty-three, first pregnancy; admitted 1st June, 1886; delivered same day. Became maniacal. Died 19th June, 1886, of septicæmia.

CASE XXXVIII.—J. M'K., aged thirty, sixth pregnancy; admitted 30th July, 1886, suffering from accidental hæmorrhage. Labour had commenced. Ergot and stimulants administered and membranes ruptured, but as this did not check the hæmorrhage, and the os being small, and patient very low, the child's head was perforated and delivery effected without much trouble. Placenta, which was still attached, removed immediately, and iron injected, but as patient was evidently sinking she was transfused with saline solution, which had a marked temporary effect; but she died two and a half hours afterwards. No *post mortem.*

CASE XXXIX.—C. K., aged thirty, second pregnancy; admitted 2nd August, 1886; delivered 3rd; was suffering from bronchitis, and stated she had always had a bad chest. Died 12th August, with symptoms of pleuro-pneumonia. No *post mortem*.

CASE XL.—K. K., aged twenty-five, fourth pregnancy; admitted 20th August, 1886, in an almost collapsed state from phthisis. Seen by Dr. Wallace Beatty. Died of acute phthisis, with pneumo-thorax, 14th September, 1886.

CASE XLI.—B. B., aged twenty, first pregnancy; brought to hospital in an unconscious state from hæmorrhage, from which she had suffered during the passage from Liverpool the previous night. When first seen she was lying on the floor of a lodging-house at the North-wall, almost naked, quite insensible and cold. All means tried to produce reaction when admitted, with some success at first, but hæmorrhage again came on, and when examined a hydatidiform mole found, which was removed without much difficulty or bleeding. Perchloride of iron injected, but as patient was sinking she was transfused with saline solution, without effect.

CASE XLII.—J. K., aged seventeen, first pregnancy; admitted 26th January, 1884; delivered same day of a 4½ lbs. child, which died two days after its birth. Patient had well-marked venereal rash, and vulva was covered with warts. Became jaundiced two days after delivery. Left hospital on the tenth day after delivery, having signed a declaration that she was doing so contrary to the wishes of the staff, and died at home, 11th February, 1884, of symptoms of acute yellow atrophy of the liver.

CASE XLIII.—B. K., aged eighteen, first pregnancy; admitted 29th June, 1886; delivered same day of a 9½ lbs. child, by natural efforts. Taken out of hospital 11th July by her father, who signed a declaration that he did so contrary to the wishes of the staff. Died 12th July, 1886, of septicæmia.

These 43 cases include all deaths which could in any way be connected with delivery, inquiries being instituted from time to time with respect to any patient who left the hospital in a state not entirely satisfactory. There was no patient transferred to any other hospital during the time. It will be observed in reading over the particulars of the 43 cases that two patients died over five

weeks, one over four weeks, and three over three weeks after delivery. Such cases are frequently omitted in calculating the puerperal mortality, owing to the length of time that had elapsed since their delivery. From these notes it will be seen that seven deaths were due to hæmorrhage, two to acute yellow atrophy of the liver, three to convulsions, one to exhaustion from discharge from encysted peritonitis, one to congestion of the lungs, three to phthisis, one to tuberculosis of lungs and brain, one to acute bronchitis, three to pleuro-pneumonia, one to pneumonia and Bright's disease, one to syncope, one to excessive vomiting, with hæmatemesis, eighteen to septicæmia.

These 18 cases of death from any form of septic infection give a mortality of ·52 per cent., or 1 in 189·6 ; but I consider a better criterion of the health of the hospital is the number of patients who had absolutely normal temperatures and pulses during the puerperal state. I take what is considered by most authorities as the maximum physiological temperature—namely, 100·4° F., or 38° C., and I find that the percentage of cases which did not exceed this maximum at any time during the puerperal state to be for the three years as follows :—In 1884, 74·66 ; in 1885, 83·54 ; and in 1886, 85·75. I consider that the above percentages might fairly be increased, for there are many slight causes which might temporarily raise the temperature, as, for instance, constipation, pain from distended breasts, nervous excitement and fretting, which latter are often observed after a visiting day, owing to the reception of bad news, or such as the case which just occurs to me of a woman whose perinæum I had sutured being told by an adjacent patient that she would die if the stitches gave way. To this alone could be attributed a sudden elevation of temperature, which came down again next morning to normal. Also, it must be borne in mind that for 12 hours after delivery the temperature gradually rises, and if this increase coincides with the evening rise it may exceed the normal maximum, especially if labour had been difficult, with, perhaps, temperature at 102° or 103° F. before delivery, and, therefore, to give a true chart, the temperature for the first 12 hours should not be considered, yet in my records I have done so.

The temperatures are taken in the Rotunda only at stated periods, morning and evening, unless for special reason to the contrary.

I will now give a short table of the cases of abnormal temperatures—*i.e.*, those exceeding 100·4° F., or 38° C.—and in order to simplify it as far as possible, I have tabulated the cases according to centigrade scale :—

	1883–84	1884–85	1885–86	Total
Number of patients in hospital each year -	1,109	1,112	1,193	3,414
Temperature exceeding 38° C., or 100·4° F., but not exceeding 39° C., or 102·2° F. -	176	94	93	363
Temperature exceeding 39° C., or 102·2° F., but not exceeding 40° C., or 104° F. -	86	68	58	212
Temperature exceeding 40° C., or 104° F., but not exceeding 41° C., or 105·8° F. - -	19	21	17	57
Temperature exceeding 41° C., or 105·8° F., but not exceeding 42° C., or 107·6° F. -	—	—	2	2
Sum total for each year of abnormal temperatures - - - - -	281	183	170	634

I find there has been a yearly increase in the number of patients in the labour wards during the three years. In Dr. Macan's Report he mentions that the number of women attended during the year ending November, 1883, was 1,090; for the year ending November, 1884, the number, as I make it, was 1,109; in 1885, 1,112; and last year it reached as high as 1,193.

Thus, not only has there been an annual increase in the number of patients, but, as can be seen by referring to the foregoing table, the general health of the hospital has improved.

I now come to consider the forceps cases. There were 203 women delivered by that means—a percentage of 5·96, or 1 in 16·75. Of these 6 died, only 2, however, of the 6 from septicæmia—1 being the patient with a fœtid discharge when admitted, whose case (No. 12) I have already given the particulars of. These 6 cases give a mortality of 2·95 per cent., or 1 in 33·83 in forceps

cases. The forceps are not applied unless there are positive indications to warrant their application either on the part of the mother or the child. Those on the part of the mother are, I think, too familiar to require mention, but those on the part of the child which we considered indicated danger to life are either a very quick or very slow fœtal heart, or the escape of meconium per vaginam when the head presented.

Dr. Neville's axis-traction forceps is the one most frequently used of late, and it appears to act very well. It has, I think, many advantages over the axis-traction with rods, being more portable, more easily applied, distends the perinæum less, can be used, if desired, as a simple forceps, can be more thoroughly cleansed, and there is no danger of injuring the vagina, as may sometimes happen when using the other pattern, by the mucous membrane being caught between the blades and rod.

A subject to which I particularly wish to draw the attention of the members is the treatment of retained placenta, and especially when the placenta is adherent. I divide this subject into two classes—1. Cases of simple retained placenta; 2. Cases of retained adherent placenta. The first of these classes I sub-divide into two heads—namely, cases without irregular contraction, and cases of irregular contraction.

The treatment of retained placenta without irregular contraction is very simple, provided the bladder be empty, but simple as the proper treatment is, I am convinced that the hand is often unnecessarily passed into the uterus to remove it.

The instruction formerly given was that the hand should be kept exerting steady pressure on the fundus of the uterus during the third stage of labour. But if this be not properly done it will, instead of doing good, actually do harm, for, as the fundus is occasionally deflected to either side (usually the left), when pressure is made in the mesial line in the hope of expressing the placenta, the lateral flexion is still more increased thereby, folding the uterus as it were on itself, and pressing the placenta towards the fundus rather than from it through the os. I consider that the present practice of the hospital—*i.e.*, moving the fingers lightly over the uterus—

is preferable, and certainly much less tiresome to the hands than the steady pressure.

Of simple retained placenta I have seen some cases where the treatment was very simple—namely, raising the fundus out of its abnormal position, when the placenta was immediately expelled without any pressure being exercised.

Cases of irregular or hour-glass contraction, a well-known expression, are sometimes met with in the third stage, and are said to occasionally occur naturally, but I believe it is much more frequently produced artificially by the hand being placed during this stage not on the fundus but somewhat lower down—possibly at the "ring of Bandl," and pressure and friction there continually used, exciting and causing the circular fibres situated in that particular part of the uterus to contract tonically. If this contraction ring be below the edge of the placenta it will prevent it from getting down into the lower segment of the uterus, or it may be gripped by the ring, in either case, perhaps, necessitating the introduction of the hand for its removal.

In cases of retained placenta due to irregular contraction, whether naturally or artificially produced, the difficulty may, I think, be sometimes overcome by removing the hand from the uterus, especially if not properly applied, and douching it out well, preferably with hot antiseptic solution, but in its absence with plain water.

When the placenta is adherent I believe the proper treatment is to pass the hand or fingers into the uterus and detach it, although I have been informed that some Continental obstetricians allow the placenta in such cases to remain for even a month after delivery (unless there is hæmorrhage or symptoms of septicæmia), especially in the cases where the patients have not come to their full time. I consider, however, that if the operator's hands be not perfectly aseptic this is the most dangerous of all operations met with in midwifery practice, except the Cæsarian section. It has been recommended by some authorities to keep the fingers inside the membranes during the operation, but there are many cases met with where, owing to the friable nature of

the placenta, necessitating the removal of small pieces at a time, this is impossible. Should there be any septic infection about the hand, and especially about the nails, the usual seat of such poison, I fail to see how such a patient can escape becoming infected; for it is analogous to vaccination, except that virulent poison is substituted for healthy lymph, and with unfortunately greater likelihood of its taking effect, owing probably to the prolonged contact. The uterus, except where it has been already douched out with the hope of getting the placenta away, as I have already mentioned, is always douched with antiseptic solution prior to introducing the hand. Although the left hand is recommended by many as being smaller and corresponding more with the pelvic curve, the right hand is the one generally used, for, the patient being in the obstetrical position usual in this country, the fundus of the uterus can be better and more easily supported by the left hand (the operator standing at the patient's back). Nor can an assistant, no matter how experienced he may be, support the uterus so satisfactorily as the operator himself, who knows the exact part of the uterus requiring pressure so as to bring that particular part of the uterine wall nearer to the introduced hand, and who is able to remove it to some other part the moment required.

An anæsthetic, usually chloroform, is nearly always administered, in order that, if necessary, the hand may be passed in a second time where doubt exists whether all the placental tissue has been detached; for if the patient be perfectly conscious of what is being done, the operator must be very resolute to be able to withstand her solicitation not to pass the hand a second time, and I consider that, once the hand is introduced, the operation should be persevered in to entire completion. When satisfied on this point, the uterus should be again douched out with antiseptic solution. I have recorded in Table A 37 cases of adherent placenta removed during the three years, giving a percentage of 1·08, or 1 in 91·95. Of these 37 patients 6 died, giving a mortality of 16·2, or 1 in 6·16. This, no doubt, seems a large mortality, but it is not so large as that recorded by the late Dr. M'Clintock, as observed by himself and Dr. Hardy in the Rotunda, where, out of 28 cases 10 died,

giving a percentage of 35·7, or 1 in 2·8, fatal cases. Of the 10 deaths 9 were from puerperal fever.

The above six fatal cases cannot, however, all be attributed to the operation, as in three death took place immediately after the children were born—in order that perchloride of iron might be injected owing to severe *ante-partum* hæmorrhage—two of which three died within two and a half hours after delivery; the third (No. 30 in Table of Deaths) died of pyæmia; another was a case of convulsions, the woman never having recovered consciousness; the fifth was a case of death from syncope (No. 25), death occurring almost before the placenta was removed, which had been retained for two days with considerable hæmorrhage; in the sixth case death resulted from septicæmia (No. 12). The particulars of this case I have already referred to in connection with the forceps cases, but hope I shall be excused for reminding you that the placenta when removed had a very fœtid smell. Thus, of the six deaths only two were due to septicæmia, or 1 in 18·5, or 5·4 per cent.

When the perineum is lacerated over $\frac{3}{4}$ of an inch in extent the practice is, having douched out the vagina with antiseptic solution, to suture immediately either with silk or catgut (using in the latter the continuous suture).

The results have been very satisfactory, chiefly owing, I think, to the stitches being inserted deeply so as to bring the whole of the torn surface into apposition. For if this be not done the lochia would probably collect between the edges of the wound, causing them to become unhealthy, especially should the discharge be fœtid, and this unhealthy condition when once produced is very likely to go deeper, until possibly it might invade the whole depth of the perinæum, causing the stitches to slough out, and the wound to gape widely open. I consider that a patient whose perinæum has been lacerated in the first confinement (especially if the child were large), and that it has afterwards united properly, is much less likely to subsequently suffer from prolapse than if the perinæum remained intact, for in the latter case it would show that the parts were very relaxed.

Before concluding I shall briefly refer to some of the subjects to

which Dr. Macan alluded at the end of his Report. Concerning the retention of a portion of the membranes, the practice of the hospital is to make gentle traction, having as a rule tied a ligature on it as close to the vulva as possible, and thereby gaining a firm hold so that it can be twisted into a cord or rope-like body whereby the chance of breakage is reduced. Should, however, the membranes break well inside the vulva, the best course is to allow them to remain there, but the douche may be used, which may possibly cause the piece to come away, and will in any event be beneficial if an antiseptic solution be employed. This course is far preferable to introducing the fingers or hands, whereby air is introduced—a fertile source of fœtid discharge. I cannot recall a case where the adoption of the course I recommend was to be regretted. As to hæmorrhage, I do not consider it is ever traceable to the retained membrane, but to the imperfect contraction, which is the very cause of the membrane not being expelled.

The prophylactic antiseptic treatment of ophthalmia neonatorum is never adopted until the disease is actually manifest. Both eyes, even though only one shows symptoms, are then treated with nitrate of silver solution, 8 grains to the ounce—pieces of lint dipped in cold water meantime being constantly kept on the affected eye or eyes. Where one eye only is affected, it would be well to have the other bandaged up so as to prevent contamination by the discharge coming in contact with it. Such a bandage is, however, difficult of application. The number of these cases recorded for the three years was 34—possibly there may have been two or three more unrecorded; this is a percentage of ·99, or, in round numbers, 1 in 100, which, when compared with other nationalities, is very low.

Infantile asphyxia is treated according to Schultze's method, which, perhaps, I shall be pardoned for endeavouring to describe. First the finger is passed into the child's mouth, and the mucus removed as far as possible. The child is then placed on its back, and the operator's hands are put under its back so that they lie at each side of the spine, the fingers in the direction of the child's lower extremities, and its head resting, or partially resting, between the ulnar side of the operator's hands. The index fingers are then

passed underneath the axillæ from behind forwards, the remaining fingers continuing to support the back. The operator now stands up, allowing the child to hang with its feet downwards. The child is now swung upwards so as to cause the legs to fall over the body, and the thorax to be compressed by the thumbs, and then after an interval the legs are swung back to the original position, so that the child will be, as it were, in the vertical or standing position, from whence it is again hoisted to the second position. This movement is repeated eight or ten times, and then the child is placed in a warm bath for a few minutes, during which time any mucus that has collected in the larynx is removed by aspiration through a catheter. Not alone is there compression and expansion of the thorax, but the mucus is frequently ejected into the mouth when the child is swung into the second position. Care should be taken not to jerk the child lest some of the internal viscera should be thereby injured.

The incubator has, I am satisfied, been the means of saving the lives of many infants, as, notwithstanding the efforts of the mothers to keep up warmth, I have seen the extremities of the child become œdematous and frequently assume an almost erysipelatous appearance, feeling quite cold, accompanied with inability to draw the breast, and marked fall of temperature, yet when these infants were placed in the incubator an improvement was visible in 24 hours, and generally after a further 24 hours the child seemed completely restored, with the swelling gone, colour natural, extremities warm, and perfect ability to take the breast. I should mention that such children always get wine-whey. It has been urged against the incubator that when the children are taken out, and especially if taken home, they are liable to die. This I do not admit in the sense in which it is used, as if a child has improved in health it must be better able to meet further attacks and the absence of proper care. The fact that in some cases the incubator fails to save a life will not show that it is inefficient in all cases, and where the incubator fails, in my opinion, the life of the child is fated in any event to be a short one.

For the statistics of the external maternity I am indebted to

Q

J. H. Knowles, M.D., ex-Clinical Clerk, who furnished the following :—

Total number of cases for the three years, 4,766.

TABLE B.

Forceps	-	-	-	-	81, or 1·699 per cent.	=1 in	58·83
Version	-	-	-	-	10 ,, 0·209 ,,	=1 ,,	476·6
Accidental hæmorrhage		-	-	-	16 ,, 0·335 ,,	=1 ,,	297·25
Placenta prævia		-	-	-	11 ,, 0·230 ,,	=1 ,,	433·27
Post-partum hæmorrhage		-	-	-	40 ,, 0·839 ,,	=1 ,,	119·15
Secondary *post-partum* hæmorrhage			-	-	5		
Adherent placenta	.	-	-	-	11 ,, 0·230 ,,	=1 ,,	433·27
Breech ·	-	-	-	.	75 ,, 1·573 ,,	=1 ,,	63·54
Footling	-	-	-	-	20 ,, 0·419 ,,	=1 ,,	238·3
Prolapse of funis	-	-	-	-	16 ,, 0·335 ,,	=1 ,,	297·87
Face -	-	-	-	-	18 ,, 0·337 ,,	=1 ,,	264·77
Twins ·	-	-	-	-	48 ,, 1·007 ,,	=1 ,,	99·08
Deaths	-	-	-	-	16 ,, 0·33 ,,	=1 ,,	297·87

Six of the deaths were from septicæmia ; 2 of the patients died in the Auxiliary Hospital. Perchloride of iron injected in one case of *post-partum* hæmorrhage.

PATHOLOGICAL SECTION.

CASE OF A LIVER WITH TWO GALL-BLADDERS.

By J. M. PURSER, M.D.;

Professor of Institutes of Medicine in the School of Physic ;
Physician to Sir Patrick Dun's Hospital.

[Read in the Pathological Section, November 5, 1886.]

On April 5th, 1886, a girl, aged eleven years, was admitted into Sir Patrick Dun's Hospital. She had been ill of malignant scarlatina for five days. She was comatose, covered with a dark purple eruption; the extremities were cold; there was suppression of urine. She died a few hours after her admission.

On *post-mortem* examination, besides the usual appearances in the intestine, spleen, lungs, and kidneys, a remarkable abnormality was discovered in the liver.

The gall-bladder appeared unusually large and notched at its fundus. On closer examination it was found that there were two distinct gall-bladders, each with its own cystic duct. These two sacs were covered by a common investment of peritoneum, which did not dip down between them, but each had its own fibro-muscular coat, and their adjacent surfaces were separated by some loose areolar tissue, so that after removal of the peritoneum they could be detached from one another, as is represented in the plate. The two bladders were of approximately equal size, and each contained bile of healthy appearance. The right cystic duct passed below and behind the duct of the left gall-bladder and opened lower down into the hepatic duct. Both ducts were pervious, and there was no communication between them at their point of crossing.

The common bile duct opened in the usual way into the duo-
denum.   At the liver the hepatic duct divided into three branches;
one passed to the right lobe, another to the left lobe, and a third—
of smaller size—passed backwards to the Spigelian lobe.

In the wall of the right gall-bladder a small lymphatic gland
was situated.   The liver in other respects was normal.

The existence of two distinct gall-bladders seems to be a very
rare anomaly in the human subject; and, so far as I have been
able to search, I have not found a record of any case precisely
resembling that now described.

Rokitanski[a] mentions, in speaking of the abnormalities of the
biliary passages, that the gall-bladder sometimes "seems divided
longitudinally or transversely, owing to a rigid condition of the
internal folds."

Henle[b] speaks of a division of the gall-bladder by a long or
transverse septum, and refers to Huschke, whose work I have
unfortunately not been able to consult.   In Quain's Anatomy[c] it
is said:—"Sometimes the gall-bladder is irregular in form, or is
constricted across its middle; or, but much more rarely, it is
partially divided in a longitudinal direction."

Meckel, also, speaks of division by a longitudinal septum.

Frerichs,[d] Forster,[e] and Birch-Hirschfeld,[f] make no allusion to
double gall-bladder, nor do the writers on the diseases of the
liver and bile passages in Ziemssen's Encyclopædia mention it.

It is evident that the division of a single bladder by a longitu-
dinal septum is different from the present case.   Such an anomaly
is similar to that figured by Owen[g] as occurring in a giraffe dissected
by him.   Here the gall-bladder was divided longitudinally, but
both divisions opened into a common duct.

Erasmus Wilson[h] does not seem to have met with a double

[a] Manual of Pathological Anatomy (Syd. Soc.), Vol. II., p. 158.
[b] Eingeweidelehre, p. 218.
[c] Ninth edition, Vol. II., p. 626.
[d] Diseases of Liver (New Syd. Soc.).
[e] Handbuch d. speciellen pathologischen Anatomie.
[f] Lehrbuch d. pathologischen Anatomie.   Bd. II.
[g] Comparative Anatomy of Vertebrates, Vol. III., p. 480.
[h] Todd's Cyclopædia, III., p. 164.
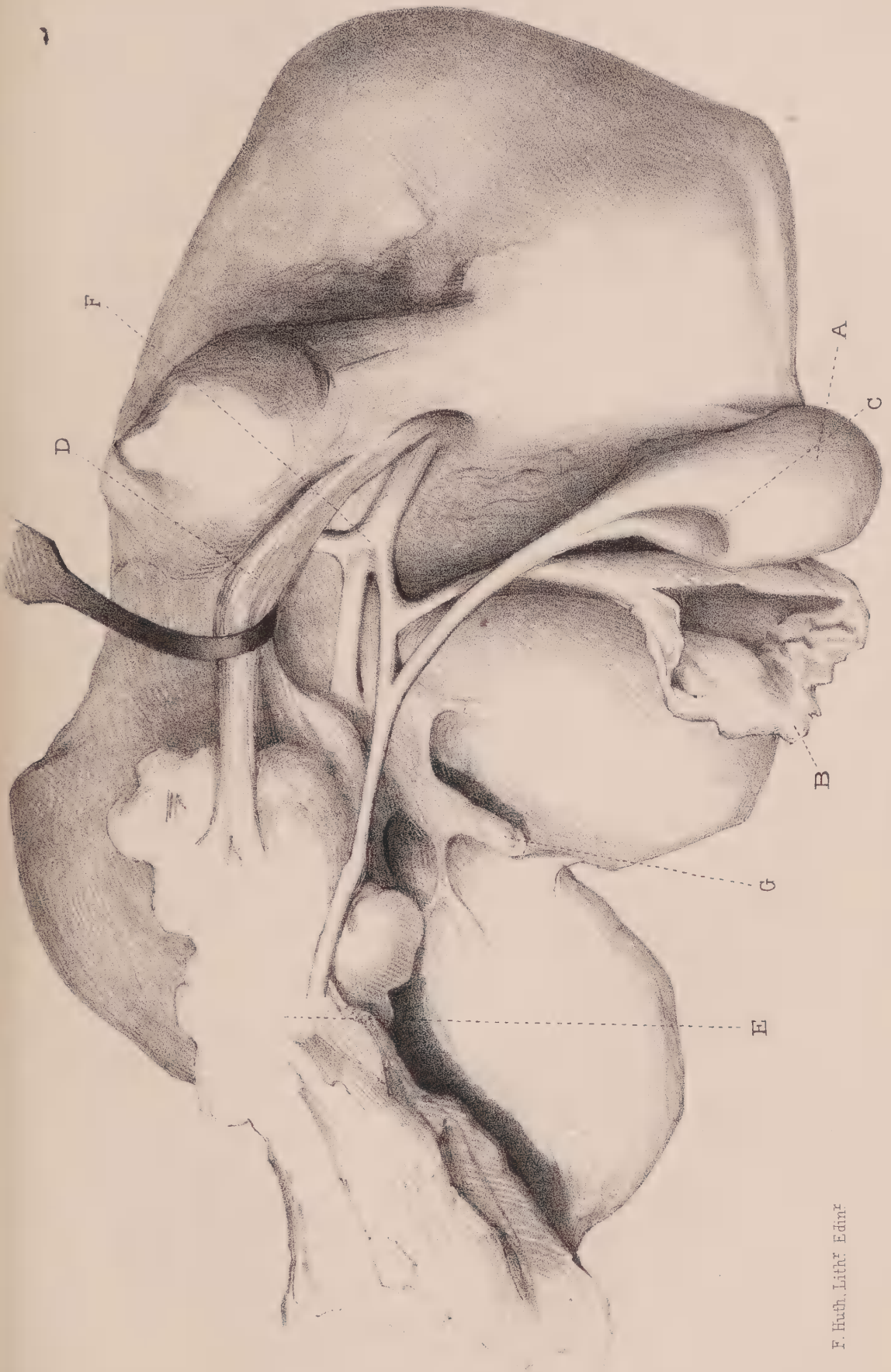
Dr. Purser on double Gall Bladder.

gall-bladder in the human subject, but he says:—"Among the lower mammalia, as in cats, a double or accessory gall-bladder is by no means uncommon. Kiernan has observed several instances of this variety. I myself have seen two, and have one at present before me. In the kinkaju an accessory gall-bladder is the normal character, and in the liver of a small animal preserved by Hunter in the Museum of the College of Surgeons, there are three gall-bladders."

I am indebted to Dr. Foot for a reference to the following remarkable case:—A lady, aged thirty-one, suffered from loss of appetite, vomiting, and pain, and died after a long illness. Among other changes, the liver was found "surprisingly large, occupying not only the right hypochondrium, but the left also; while the spleen was smaller than usual. Moreover, there were strong adhesions of the liver, both in the right and left side, so that it could not be detached without much trouble and violence. . . . Not only was that portion of the liver which filled the right hypochondrium provided with a gall-bladder, but likewise that which occupied the left—i.e., there were two gall-bladders, both turgid with bile."

A large branching calculus was found in the left kidney. The vomiting and purging from which the patient suffered during her life are attributed by Dr. Wittie, who records the case, to the redundancy of bile poured out by the two gall-bladders.[a]

EXPLANATION OF PLATE.

A. Right gall-bladder.
B. Left gall-bladder, laid open.
C. Lymphatic gland.
D. Vena portæ.
E. Duodenum, with portion of adherent pancreas.
F. Hepatic duct, dividing into three branches.
G. Umbilical vein.

[a] The Philosophical Transactions of the Royal Society of London, from their commencement in 1665 to the year 1800. Abridged, with notes and biographical illustrations, by C. Hutton, G. Shaw, and R. Pearson. Vol. III., 1683–1694, p. 612. London. 1809.

A CASE OF COLLOID CARCINOMA OF THE STOMACH.

By KENDAL FRANKS, M.D., F.R.C.S.;

Surgeon to the Adelaide Hospital, Dublin ;
Surgeon to the Throat and Ear Hospital.

THE case which I desire to bring before the notice of the members of the Pathological Section of the Academy is an example of a not very common form of malignant disease, involving almost uniformly the whole of the stomach : —

CASE.—A man, aged thirty-eight, a stoker by occupation, was admitted to the Medical Wards of the Adelaide Hospital, under the care of my colleague, Dr. Wallace Beatty, on the 30th of September last. His history was that eight months previously he, for the first time, experienced a shooting pain in the epigastric region. Just below the costal margin there was tenderness on pressure. By degrees his appetite failed, he lost flesh rapidly, and he became very weak. Two months ago he noticed a tumour in the same region, which was freely movable on respiration, and which was not tender on pressure. There was very little pain, but vomiting came on shortly after taking food, and persisted in spite of remedies.

When admitted to the Adelaide Hospital he was greatly emaciated, of a sallow complexion, and with a well-marked cancerous cachexia. He presented a tumour in the epigastrium, which moved upwards and downwards on respiration. It felt hard and tolerably movable, and was not tender on pressure. He had little pain, but he suffered greatly from vomiting, which was induced by every attempt to take food. The bowels were constipated, but the urine was normal. After he had been a few days in hospital, my colleague, Dr. Wallace Beatty, under whose care he was, asked me to see him, in the hope that surgical interference might be of benefit—his diagnosis being that the case was one of

ᵇcancer of the stomach, chiefly involving the anterior wall of the
pyloris. When I examined him, I was greatly struck with a
sulcus, which I could distinctly feel below the tumour, separating
it from a ridge below, which I believed to be the free margin of
the left lobe of the liver. The right lobe seemed to be quite
healthy, but if this ridge on the left side had been the liver the left
lobe must have been greatly enlarged. After full consultation on
the case we came to the conclusion that an exploratory operation
should be performed, in order to clear up the diagnosis, and, if
possible, to remove the tumour. This was accordingly done on
the 12th October. The abdomen was opened by an oblique
incision parallel to the left costal margin, and about an inch below
it, measuring about 5 inches in length. This at once exposed a
large tumour, which proved to be a colloid carcinoma, involving
the whole thickness of the stomach walls, almost in their whole
extent. The ridge below this, which I had imagined to be the
margin of the left lobe of the liver, proved to be the upper portion
of the great omentum, thickly infiltrated with cancer. On passing
my hand down behind the stomach I could quickly recognise that
the pancreas and transverse colon participated in the disease, and
that hope of removal was utterly vain. The appearance of the
anterior wall of the stomach was most remarkable. It was very
white and looked somewhat like a shape of sago. It felt tolerably
firm, and large vessels ramified over its surface. All appearance
of peritoneum had entirely disappeared from it. There was very
little ascites present.

The abdomen was closed by successive layers of sutures, the
wound dressed with dry antiseptic gauze, and the patient removed
to bed. He suffered scarcely at all from the effects of the opera-
tion or of the ether, and expressed himself next day as relieved. On
the sixth day the wound appeared to be firmly healed, and, as the
chart shows, the temperature never rose above 99·2°. He was,
however, unable to take food by the mouth, and enemata had to be
administered. On the fifth day diarrhœa set in, and though partly
controlled, was not checked till the 21st, by the compound lead
suppository. The patient grew weaker and weaker, and died on
the 25th, on the twelfth day after operation. It was difficult to
obtain a *post-mortem* examination, so we had to be content with a
removal of such organs as could be reached by opening up the
original incision. It was then found that the healing of the
wound was perfect, and that there was not the slightest trace of

peritonitis. The organs removed consist of the entire stomach, with the great omentum; the spleen, which is firmly adherent to the stomach; the pancreas, the larger end of which appears to be infiltrated; the transverse colon, and part of the duodenum. The liver, which was not removed, appeared to be quite healthy. The cancerous infiltration involved the transverse colon, whose walls were thickened, especially at the side next the stomach. The œsophageal and pyloric orifices are both patent, each allowing a finger to be passed through it. The various layers of the stomach are not easily distinguishable. The mucous membrane appears rugous, infiltrated, and darkly stained, and would seem quite incapable of performing its functions in digestion. There is no ulceration, and I cannot detect the lacunæ on its surface depicted by Cruveilhier in his plates.[a]

This absence of ulceration, which is observable in these cases of colloid carcinoma, explains the absence of coffee-ground vomiting and of malæna, neither of which were observed in the present case. Dr. Foot has kindly drawn my attention to three similar cases, drawings of which he possesses, which were reported to the old Pathological Society by Dr. Stokes. They bear such a strong resemblance to the present case that I must briefly refer to some of their points of interest. In the case I now lay before the Academy I have mentioned the existence of a sulcus below the tumour, felt during life, and a ridge which I believed was the lower margin of the left lobe of the liver, and which therefore led me to believe that possibly the tumour was hepatic; but that on opening the abdomen I found that this ridge was due to cancerous infiltration of the omentum, and that the liver, which was of normal size, was quite healthy. Dr. Stokes, referring to one of his cases, reported in Volume IV. of the Proceedings of the Pathological Society of Dublin, p. 179, observes :—" During life I thought I could distinctly feel the thin edge of the liver. Dr. Hudson had had the patient under his charge some few days before she was placed under my care, and he stated that between what I took for the edge of the liver and the real margin of that organ there was a distinct line of demarcation. The *post-*

---

[a] 37th Livraison. Pathological Anatomy.

mortem examination showed that this opinion was correct, and that what I had supposed to be the margin of the liver was really that of the omentum loaded with cancer. The liver was perfectly normal, both in size and form." He goes on to say :—"The stomach was of prodigious thickness. The cardiac end of the organ was scarcely at all affected, but the pyloric extremity was thickened prodigiously. There was no ulceration of the interior of the stomach ; the pyloric orifice was only slightly narrowed—a finger could be passed into it with facility." This remarkable thickening of the walls of the stomach is well illustrated in the specimen before you. In another case reported by Dr. Stokes in the same volume, p. 290, he refers to Cruveilhier's plate of cancer of the stomach and great omentum, which closely resembled the case he exhibited. In this case, as in mine, the entire of the stomach was infiltrated with cancer. I may also add that, though the transverse colon is implicated, the duodenum seems to be perfectly healthy. This coloured drawing [exhibited] very well illustrates the chief points to be observed in the specimen. I am indebted to Dr. Bewley for these microscopical preparations, which show the colloid nature of the disease.

FIBROMA OF CORNEA.

By ARTHUR H. BENSON, M.A., F.R.C.S.;

Assistant Surgeon, St. Mark's Ophthalmic Hospital.

[Read in the Pathological Section, November 5, 1886.]

THE tumour, sections of which (kindly made for me by Dr. Patton) are under the microscope on the table, was taken from the apex of the cornea of a girl—M. B., aged nineteen, otherwise in good health.

History.—She stated that three years ago she, for the first time, observed a white speck in front of the pupil of the eye. It was then about the size of a small pin's head, and its appearance had not been preceded by any pain, vascularity, or other sign of inflammation.

The spot slowly grew both in density and extent of surface, and gradually obscured vision more and more till September 24th, 1886, when I first saw her at St. Mark's Hospital. The appearance of the eye then somewhat suggested that of one in which there had been a deep ulcer, which had healed up, leaving a dense leucoma in the centre of the cornea. On further examination, however, the opacity in the cornea was found to be raised above the surface of the surrounding cornea, to the extent of nearly a millimetre, whilst the normal corneal tissue under the tumour remained transparent. It was perfectly circular, 4mm. in diameter, with well-defined edges, and the corneal epithelium extended over it without interruption. There was no evidence of past inflammation in any neighbouring part of the eye. Both the history and the appearance, therefore, precluded the idea of its being a leucoma. For a short time before I saw her, though there was no sign of inflammation, she had had some discomfort in that eye, but it was on account of the remarkable appearance of her eye that she sought relief. Tested with her back to the light she could see nearly as well with one as with the other eye, both being myopic— $V = \frac{6}{18}$. Facing the light the vision of the left eye was almost

wholly obscured, but with atropine she could see well enough. As it was extending, and had already so far interfered with sight, I advised removal by excision. With a few turns of Bowman's corneal trephine, which just fitted it, I isolated its margins from the surrounding cornea, and with a curved broad corneal needle and a pair of forceps I dissected the tumour off from the cornea, to which it was so intimately attached that it required very definite dissection to separate it. The tumour was densely white and opaque, whilst the cornea, at nearly the normal level, was perfectly clear below it. The ulcer, which was left in the centre of the cornea, healed quickly, and the patient left hospital with only a very slight nebula remaining in place of the dense white patch.

Histologically the tumour is a fibroma, and resembles corneal tissue. The sections were unfortunately made parallel instead of at right angles to its surface, and the remains of the tumour, being so small, were not preserved. I regret this very much, as a vertical section might have thrown some further light upon its origin and nature.

Tumours of this kind are, I believe, rare; I have never before seen one, nor can I find mention of such in any of the works which I have been able to consult.

Alt, in his " Histologie des Auges," page 40, says :—" Although in the literature of the subject a large number of tumours are described as corneal tumours, I know of none such, and doubt the correctness of the term, so much the more since hardly any of them engaged the corneal tissue alone. The usual so-called tumours arise from episcleral tissue, and shall be fully considered in that connection."

My case is, however, certainly one of corneal tumour originating in the cornea.

ON THE CHANGES PRODUCED IN THE LUNGS OF SHEEP BY A PARASITIC WORM
(*Strongylus filaria*).

By HENRY BEWLEY, M.B. Univ. Dub.;

Late Assistant to the Professor of Physiology in Trinity College, Dublin.

On several occasions lately some sheep's lungs have been obtained for various purposes in the Physiological Laboratory in Trinity College, Dublin. Professor Purser drew my attention to the presence in many of these lungs of small nodules or tubercles, whitish-grey in colour, some about the size of a small shot, others larger, being as much as $\frac{1}{8}$th inch or more in diameter. In fact, they much resembled the miliary tubercles seen in human lungs in cases of acute tuberculosis. They existed in large numbers both on the surface of the lung, immediately under the pleura, and also in the deeper parts of the organ. They seemed to be especially numerous along the thin edge of the lung, where they formed small, hard, shot-like elevations. The surrounding lung tissue seemed healthy.

On examination by means of microscopic sections of a number of these nodules from the lungs of several sheep, I found they were all of the same nature. In the best developed specimens they were composed of the following structures :—

In the centre, a little roundish mass of apparently dried-up purulent matter, consisting of leucocytes, lying without any distinct arrangement closely one by the other. In the centre of this mass was a round or irregular cavity, in which one long slender worm lay coiled up. The cavity in which the worm lay had no distinct lining membrane, but was only an excavation in the mass of cells. In some of the nodules the worm appeared to have died, and its place was taken by some débris and wandering cells.

Around this mass of cells there was a curious radiating zone of

epithelioid cells embedded in a delicate fibrous reticulum. These cells were large and elongated, with their long axis placed radially. Here and there large multinucleated giant cells were seen, exactly like those found in tubercular affections.

Around these radiating cells was a zone of small round lymphoid cells embedded in loose fibrous tissue, which was arranged concentrically round the nodule. Outside this zone was healthy lung tissue. The line of demarcation between these different zones was quite sharp and distinct. The central mass of cells, in some fresh nodules which I tore up with needles, appeared to have very little connection with the surrounding radiating zone, as it often separated from the other tissues as a little round whitish-yellow mass. When these nodules were near the surface of the lung, the pleura over them was much thickened.

The above is a description of these nodules as met with in the lung in which they were best developed. In other lungs the arrangement of the various zones, though traces of it could always be seen, was not so distinct, and the nodules were surrounded by a patch of catarrhal pneumonia.

From some nodules in a fresh lung, by tearing them up with needles, I obtained some specimens of the entire *Strongylus filaria*. Two of the worms were respectively 15 and 17 millimetres long, and very slender, appearing hair-like. I could not find any trace of reproductive organs. There was a curious arrangement of the intestinal canal in the middle part of these worms, which is not like that in any other nematode I know of. The anterior part of the intestine is quite straight; the middle part is coiled into a regular corkscrew-like spiral; the posterior part is again straight. It is common enough for part of the intestine in nematodes to be alternately constricted and dilated; but I have not been able to find any drawing or description of a regular spiral arrangement such as exists in these worms.

Leuckart (*Die Menschlichen Parasiten*, Leipzig, 1867) and Baillet (*Nouveau Dictionnaire de Médecine, &c.*, Paris) allude to the nodules which these worms cause in the lungs, but they give no details of their histological structure.

The adult and mature forms, of which these are the embryos, are from 50 to 100 millimetres long, and inhabit the trachea and bronchi of sheep and goats, where they cause bronchitis. The females are viviparous, and give birth to minute worms about 6 millimetres long. These, having crept or having been coughed out of the animal's mouth, pass, according to Leuckart, into the body of some insect or snail, where they undergo further development. Afterwards they are again taken into the mouth of a sheep, probably with moist grass, and from its mouth or œsophagus creep into its larynx and trachea. In ruminants this can the more readily occur, because the food, having been swallowed, is brought up a second time into the mouth.

The life-history of these worms from the time they are taken into the sheep's mouth to that when they are found as full-grown sexual worms in the bronchi, does not appear to be well known. It may be that they all pass down into the lungs, become encysted there in the nodules I have described, and, having become more fully developed there, in some way get back into the bronchi; or else the worms, having crept from the sheep's mouth into his trachea and bronchi, remain and develop to full maturity there. In this case the worms in these nodules in the lung would be individuals who had crept into too small bronchi, and had set up such an amount of inflammation there as to obliterate the bronchus and cause these inflammatory nodules to form. Or else these worms may have penetrated into some blood-vessel in the wall of the alimentary canal, and have been carried to the lungs with the blood. In favour of this view is the fact, that many of the nodules existed along the thin edge of the lung, in a situation where there are no bronchi except those of the most extremely minute size. In any case, I do not think that the being encysted in the lung forms any stage of the normal life-history of these worms. It seems more probable that they normally remain in the trachea and there develop to full maturity, and that these individuals which are found in the nodules in the lungs have, so to speak, lost their way among the tissues of their host, and that they remain in the nodules till they die. This view I think the more probable, because—

Fig. 1.

Fig. 2.

Fig. 3.

F. Huth, Lith' Edin'

Dr H. Bewley on
changes produced in the Lungs of Sheep by a Parasitic Worm.
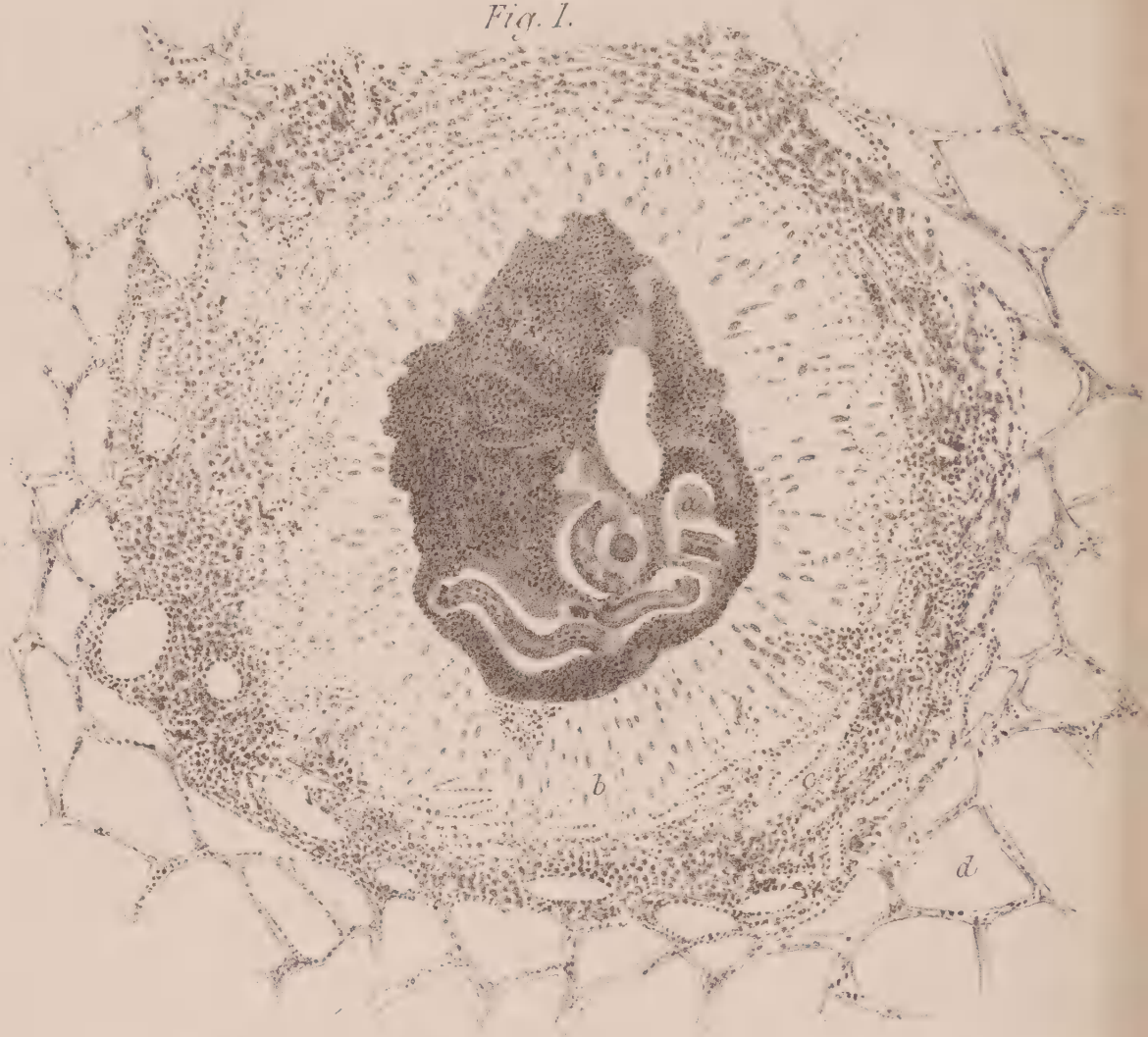
1. A good many of the nodules contain not living worms, but the remains apparently of dead worms.

2. All the worms in the various nodules are about the same size, and none appear to be more fully developed than the rest.

3. It is not easy to see how these worms could escape out of such nodules as these, and bore their way through the lung tissue till they arrived at a bronchus of sufficient size to contain them.

This affection appears to be very common at present. Nearly all the lungs of sheep that I have seen lately contained a larger or smaller number of the nodules.

In conclusion, I must express my warm thanks to Dr. Purser for the assistance which his advice and suggestions have given me in the examinations I have made of the lungs containing the embryos of this worm.

EXPLANATION OF PLATE.

Fig. 1. Worm (*Strongylus filaria*) coiled up in nodule in lung of sheep. × 120 cir.

Fig. 2. Nodule in lung of sheep caused by parasitic worm ; showing *a*, the worm coiled up in the central dense part ; *b*, the zone of radiating epitheloid cells round it ; *c*, the zone of lymphoid cells ; *d*, the healthy lung tissue. × 76.

Fig. 3. Nodule in lung of sheep. × 300 circa. A, central part in proximity to worm ; B, zone of radiating epithelioid cells ; C, zone of concentrically arranged lymphoid cells.

STRICTURE OF THE ŒSOPHAGUS.

By D. EDGAR FLINN, F.R.C.S.;

Surgeon, St. Michael's Hospital, Kingstown.

THE patient from whom this specimen was taken, and about which I have the honour to make a communication to this Section to-night, was admitted into St. Michael's Hospital, Kingstown, on October 15th, 1886. He presented a very emaciated appearance, and had been complaining for nearly four years of a difficulty in swallowing, which he said had considerably increased of late. He was admitted under the care of my colleague, Dr. Power, but subsequently came under my notice for treatment. He had, three years previously, attended the out-patient dispensary for some time, and I then afforded him relief by the passage every alternate day of an œsophageal bougie, some days being able to pass a larger bougie than others. I lost sight of him until the date I mentioned, October 15th, when he was admitted to hospital. He told me that the act of swallowing had been gradually becoming more difficult during the last year or so, and that in February, 1886, he was an in-patient at the Mater Misericordiæ Hospital, and had also been an in-patient at the City of Dublin Hospital some time previously. At each institution he stated he received temporary relief.

On his admission into hospital he was very weak, had an anxious expression of countenance, was very pallid, and complained of extreme cold in the extremities. He could only swallow milk or other fluids, and then only in small quantity. He suffered from paroxysmal attacks of severe lancinating pain in the chest; and when he attempted to swallow any liquid nourishment it nearly always became regurgitated, and had to be ejected from the mouth.

ıThere was a frequent regurgitation of a brownish fluid of an offensive odour.

For the first week or ten days he obtained relief by the passage, daily, of a small œsophageal bougie, No. 14. I was unable to pass a larger size than this. About the fourteenth day after his admission he became troubled with a most distressing cough, which was very much aggravated on the slightest attempt to swallow, and which made the passage of any dilating tube, no matter how small, both difficult and hazardous.

The stricture became more and more contracted, notwithstanding every effort to keep it dilated, a No. 10 catheter becoming difficult to pass. Nutrient enemata were administered three times a day, and the distress alleviated by hypodermic injections of morphia. He continued daily to grow weaker, and died about three weeks after his admission to hospital.

A *post-mortem* examination was made by Dr. Stewart, the surgeon in residence, and it was found that the left lung was very much atrophied and collapsed. The walls of the œsophagus were greatly thickened, and surrounded by a hardened mass, matted together, which implicated the neighbouring structures. The œsophagus was very much narrowed in its lower fourth; and the most contracted part of the stricture was found to be about three-quarters of an inch from the cardiac orifice of the stomach, and would hardly admit of a small-sized pen handle being passed through it. The stomach was enormously dilated—so much so that when the abdomen was opened it appeared to fill up the entire cavity, and was full of a brownish fluid, very offensive in odour. A large fruit stone was found immediately contiguous to the pyloric orifice, embedded in a pouch or diverticulum. This fruit stone must have lain in this diverticulum for a very long time; for it is to be assumed, from the *post-mortem* appearances, that its passage through the œsophagus would have been well-nigh impossible for the last two years of the patient's existence. From its position near the pylorus it exercised some pressure on the pyloric orifice; and thus, in some measure, the dilatation of the stomach may be accounted for.

Dr. M'Kee, the Curator of the Royal College of Surgeons, was

R

good enough to make a microscopic examination of the parts for me, and he informs me that the disease implicating the œsophagus was epithelioma, and that all the glands in the neighbourhood of the œsophagus were affected also.

This being the case, it is a matter for surprise that the patient lingered so long. Yet we know, as Mr. Erichsen states, that a fibrous stricture of the œsophagus may at any time degenerate into a malignant one, and most probably become epitheliomatous; as we are aware, also, epithelioma is much less malignant in the sense of the term than other forms of cancer—it will destroy life less quickly.

In the case under notice the patient was so worn and emaciated on his admission to hospital that any further operative interference than those I have mentioned would have been contra-indicated.

SIMULTANEOUS FRACTURE OF BOTH CLA-VICLES; FRACTURES AND DISLOCATIONS OF THE COSTAL CARTILAGES, AND INCOM-PLETE FRACTURE OF COSTAL CARTILAGE.

BY E. H. BENNETT, M.D., F.R.C.S.;

Professor of Surgery in the University of Dublin; Surgeon to Sir Patrick Dun's Hospital.

[Read in the Pathological Section, December 3, 1886.]

DR. E. H. BENNETT exhibited a cast taken from the body of a man, a patient in Sir Patrick Dun's Hospital, who had sustained this injury. He also showed the clavicles of a little girl, aged six, both of which had been broken in a tramcar accident, one completely, and the other incompletely.

The history of the first was most exact and interesting. The man was engaged the day before his admission to hospital making a cutting for pipes through the hard ground of a barrack square. His position in the cutting was such that he could just see over the surface of the ground, while its width was just such as to allow him to work with the pick as he stood facing its length. Without any warning the sides of the cutting fell in, fixing him in his position, while the harder roadway on either side pressed hard on the points of his shoulders. He was sensible of the fact that his collar bones gave way under the pressure simultaneously. He was not otherwise injured, and although unable to move himself he was readily extracted by his fellow-workmen.

Both his fractures were examples of the ordinary oblique fractures, and presented nothing exceptional in their details. Treated by strict rest on a flat mattress, with a bandage to retain the arms to the side, and a pad in each axilla, and carefully tended with food and drink by the nurses, the bones united with very little

deformity, and in the usual time. This is only necessary to be noted, as the recorded cases of this double fracture are remarkable for the fact that many of them (8 out of 18, Gurlt) are also the records of cases of non-union of one or both fractures—a complication in the ordinary fracture of the clavicle of great rarity, and evidently due to the want of rest which must occur in the double lesion if the greatest attention be not paid to the nursing and feeding of the patient. Considering the mechanism of the ordinary fracture of the clavicle, this case is of interest, for in it the compressing force clearly had acted by pressure on the points of the shoulders—that is, on the great tuberosities of the humeri, and so the fractures resulted from violence, reaching the bones chiefly through the shoulder-joints and coraco-clavicular ligaments—a twisting of the outer part of the bone, not a force acting strictly in the axes of the clavicles.

The details of the injury which had produced the fractures, complete and incomplete, of the clavicles in the little child could not be made out, only the specimens were of interest, particularly the incomplete fracture, as it was a perfect example of the incomplete greenstick fracture, which can only be reduced by the completing of the fracture; for while one half of the bone is bent and unbroken, the other—the convex side of the break—has its fractured surfaces so overlapped as to be irreducible by any other device. With these interesting fractures were associated transverse fractures on the right side of the chest of the second, third, and fourth costal cartilages, and a dislocation of the first cartilage from its rib. On the opposite side of the chest one of the lower cartilages had also been dislocated from its rib, and one had been partially fractured. These fractures of the costal cartilages had occurred at an earlier age than any that he (Dr. Bennett) had previously observed, or had been hitherto recorded.

The dislocations observed were also deserving of note, as the occurrence of such dislocation had been denied, and was certainly rarely observed, the fact being that in the adult, when the rib and its cartilage parted at their junction, the cartilage broke sheer across, leaving its extremity embedded in the cup-shaped end of

the rib; the structure of the growing rib being deficient in this arrangement, made the dislocation more likely to take place in the subject of tender age. The incomplete fracture of a costal cartilage observed in this case was interesting so far as it completed the parallel of these lesions with those of bone, but the injury differed from the incomplete fractures of cylindrical bones in being a crack placed at right angles to the axis of the cartilage, involving only part of its thickness, quite sheer and without any trace of longitudinal splitting, which is always associated with the corresponding injury of bone.

OTOMYCOSIS ASPERGILLINA.

By JOHN B. STORY, M.B., F.R.C.S.;

Surgeon to St. Mark's Ophthalmic Hospital.

[Read in the Pathological Section, January 14, 1887.]

THE subject of otomycosis is far from being a novel one, and the specimens exhibited to the Academy are of interest merely as illustrating an affection which has been familiar to otologists since Schwartze called attention to these fungi in 1865. In Schwartze's paper[a] reference is made to two authors only as having described these aural fungi at an earlier date—Mayer, in "Müller's Archives," 1844, p. 401, and Pacini, in a paper published at Florence in 1851. I find, however, that an Englishman has also preceded Schwartze—Grove—who published a description of aural fungi in the *Quarterly Journal of Microscopic Science* for 1887.

My specimens have been removed from the ears of four different individuals. No. 1, an out-patient at St. Mark's Hospital, whose auditory meatus exhibited a bright yellow colour when examined through a speculum. No. 2, a young farmer in whose meatus a bluish discharge was observed. No. 3, an old man who had suffered from tinnitus for 12 years. No. 4, a cook who had suffered for some months from a throbbing and dreadful noise in one ear, and whose meatus contained a dark-coloured deposit adherent to the membrana tympani. All the patients had suffered from intense pain except No. 3, and all, without exception, had been greatly troubled with tinnitus.

The commonest of aural fungi is Aspergillus nigricans. Wreden states that of 74 cases examined by him, 73 were aspergilli, and of these 73 all were either A. flavescens or A. nigricans. My cases are all A. nigricans except one, and this latter I have not been able to identify satisfactorily. In none of the four cases was there any actual perforation of the membrana tympani, though it was in all of them very considerably inflamed.

[a] Archiv. f. Ohrenheilkunde II., p. 5.

SPINDLE-CELLED SARCOMA.

By EDWARD HAMILTON, M.D., F.R.C.S.;

Surgeon to Steevens' Hospital, Dublin ; Professor of Surgery, Royal College
of Surgeons, Ireland.

P. H., a labourer from the country, aged forty, was admitted to
Steevens' Hospital on the 2nd of December last. He presented a
tumour growing from the right axilla, about the size of a fig. It was
pedunculated, soft, and elastic. The surface was ulcerated, tender,
and inclined to bleed. The discharge was fœtid. The growth
caused great discomfort, as the pressure and friction of the arm
was productive of much pain.

His family history was free from taint. He stated that about
August last he observed a lump in the right armpit, like a kernel,
which grew very rapidly. He applied to Dr. Ridley, of Tullamore,
in October, who removed a tumour the size of an ordinary potato.
About six weeks after removal the tumour returned, and Dr.
Ridley having gone from home, he came under the observation of
Dr. Moorehead, by whom he was sent to Dublin. While under his
care his appetite was bad, and he had two smart attacks of hæmor-
rhage from the lacerated surface.

He expressed an urgent desire that the tumour should be removed.
Accordingly, on the 4th of December, it was extirpated without
any difficulty. The cavity of the axilla was quite healthy and free
from glandular enlargement. A small molluscous tumour was
removed with the ecraseur on the following day from the right arm
above the elbow.

The structure was kindly examined by Professor Purser, and
pronounced to be "spindle-celled sarcoma." The wound healed
fairly well by granulation, and his general condition gave hopes of
recovery ; his appetite was capricious ; mental faculties were dull ;

and he used to get occasional attacks of diarrhœa. Attention was now drawn to a number of growths which appeared successively in various parts of the body—under the angle of the opposite scapula, two on the back lower down, one over the upper and one over the lower end of the left tibia, inner side of left forearm, and a number of small nodules under the skin of the abdomen and thorax. Almost all these tumours were distinctly observed to have grown while he was in hospital. After the operation for some days he used to sit up, and he expressed a strong desire to return home. His appetite began to fail; his mind became weak; and he had one or two attacks of diarrhœa, which reduced him greatly. He had no cough or respiratory trouble, no elevation of temperature. He died on the 17th, a fortnight after operation. For two days before his death he was quite aphonic.

Post mortem.—*Abdomen*—Liver enlarged, and presented one or two nodules. Spleen very much enlarged, but presented no deposits. Kidney healthy; one or two cysts in the left organ. Pancreas was extensively infiltrated with deposit, which involved the duodenum and neighbouring parts. Intestines showed several patches of infiltration. *Left lung* presented some very large masses of deposit. *Heart* presented a most remarkable infiltration into the septum auriculare, which was hard and greatly thickened. *Brain* gave no evidence of any deposit; but there were several patches of extravasation on the right side.

For the notes of this case and the *post-mortem* examination I am indebted to my intelligent dresser, Mr. Henry Joynt.

Microscopic Report by Dr. M'Kee.—An examination was made of portions of the growth from the subcutaneous cellular tissue, lung, left ventricle, pancreas and liver. The nodules in the intestines were not examined microscopically.

While the general type sarcoma is preserved, certain differences are observable according to the situation of the tumour. Thus, in the lung, pancreas, and liver, portions of the growth are sharply marked off by the presence in them of pigment, which appears black to the naked eye, but has, under the microscope, a rusty or brown colour (melanotic sarcoma). Most of the pigment is con-

ʾtained in cells, and stains them diffusely; but it is sometimes granular.

In the *subcutaneous tumours* the spindle cells are numerous and intersected by, or enveloped in, bundles of dense connective tissue (fibro-sarcoma). In many places where the cells enveloped in the bundles happen to be cut obliquely or transversely an alveolar arrangement is seen.

Within the limits of the large *tumour of the lung* the pulmonary alveoli appear to be almost completely obliterated. Here, too, the new formation consists of spindle cells and connective tissue. Here and there are found minute masses of glancing hyaline material, often containing nuclei, and apparently filling the lumen of small vessels (perhaps hyaline thrombosis).

The spindle cells in the *heart* stand out beautifully against the atrophying, highly-pigmented muscle fibres among which they lie. There is no newly-formed connective tissue. The endocardium is also involved; but whether this tissue was directly affected from the cavity of the ventricle, or only secondarily, after implication of the myocardium through the medium of the coronaries, could not be discovered.

In the *pancreas* the spindle cells have given place to round cells, many of which contain pigment. The gland tissue of the neighbourhood is atrophied, and the interstitial connective tissue greatly hypertrophied.

In the *liver* the new growth is composed almost exclusively of spindle cells, some contained in alveoli (hepatic capillaries). The liver tissue in the vicinity is undergoing cyanotic atrophy, and contains a large amount of pigment.

ANEURYSM OF THE ABDOMINAL AORTA IN A FEMALE.

By ARTHUR WYNNE FOOT, M.D., F.K.Q.C.P.;

Physician to the Meath Hospital ; Professor of Medicine, Royal College of Surgeons.

[Read in the Pathological Section, February 11, 1887.]

Dr. Foot laid before the Section a preparation and drawings (two) of an aneurysm of the abdominal aorta which he had met with in a married woman, thirty-five years of age. The aneurysm was a true one, situated on the vessel immediately above its bifurcation, about as large as a full-sized lemon, but more like a pear in shape, as the broader part of the sac was inferior. The sac had given way posteriorly and immediately above the origin of the left common iliac artery. The rent was situated in one of the most saccular portions of the dilated vessel, and presented the appearance of a four-sided aperture having a fringed margin. The mouth of the opening was obstructed by coagula; some of these were of recent formation, the remainder were portions of the stratified fibrin which elsewhere lined the sac. The common iliac arteries were not involved in the aneurysm, but the left artery was completely obstructed at its origin by one of the layers of the fibrinous lining of the sac, which had become, as it were, loosened from its connections and had shifted its position so as to slide over the mouth of this artery; hence a forceps passed up the left common iliac artery did not enter the sac, being stopped when just about to do so by this dense leather-like layer of fibrin. The laminated coagula in the interior of the sac were, at the place corresponding to the rupture, quite softened and destroyed, and presented an aperture corresponding in shape and size to that in the external tunic, which gave exit to the blood. It was possibly the disturbance of the layers consequent upon the rupture of the

sac which led to the shifting of a portion of them over the orifice of the left common iliac artery. The sac measured in length, on its anterior aspect, $4\frac{7}{8}$ inches; in circumference, at its widest part, $7\frac{2}{8}$ inches. There was no destruction of the vertebræ or pre-vertebral structures, but the left psoas muscle was so much softened and disintegrated as to admit of its removal with the fingers. The aorta above the sac was extensively atheromatous from its very origin. The rupture of the aneurysm occurred 40 hours before death; the extravasated blood, estimated at three pints, was retro-peritoneal, and showed as a large black tumour when the abdomen was opened. This tumour pushed the mesentery to the right side; the descending colon, relaxed and flattened, was moved forwards, and nearly as far to the right as the middle line of the body.

This woman was admitted to the Meath Hospital a week before her death. She presented on admission the signs of incompetence of the aortic valves—a double murmur audible all over the præcordial region, and an area of cardiac dulness of more than twice the normal extent. The symptoms she complained of were dyspnœa, palpitations (cardiac), and sleeplessness. No reference was made to the abdomen as the seat of any annoyance, or even of any uncomfortable sensation. Two years before admission she had had an attack of left hemiplegia, and the muscles of the affected side continued still paralysed but unwasted. This may have had something to say to the softened condition of the left psoas above mentioned. She was admitted on Saturday, 30th of July, and for one week her dyspnœa was continuous and extreme, preventing her from lying down; attacks of palpitation were severe but intermittent. Although the abdomen was more than once examined for the purpose of ascertaining if there were any fæcal accumulation, no tumour was detected, nor was any pain or ten-derness complained of during the manipulation. There was never any dorsal pain. On the night of the day week after her admission (6th August) she was suddenly affected with a dull aching pain, predominating in the left iliac region, and accompanied by a sharp pain "like cramps" down along the left lower extremity.

The following morning (7th) the pains continued, and the left iliac, lumbar, and hypochondriac region were occupied by a swelling, which was dull on percussion, and gave to the hand a hard lumpy sensation, as if the descending colon was extensively obstructed with hardened fæces. The pulse was now under 100, weak, and regular; the dyspnœa had moderated, and she was able to lie flat without any distress, although her *facies* was altered, but it wore neither a pinched nor an anxious expression. An enema did not remove any fæces from the large intestine. The following morning (Monday, 8th August) there was no alteration in the position or the feel of the abdominal tumour. There was no tenderness over any part of the belly, the face was very pale, pulse weak, respiration very feeble in both lungs. She sank gradually, and died at 2 p.m. on this day, 40 hours from the time of the sudden pain in left iliac region.

When the abdomen was opened there were no appearances of peritonitis, recent or chronic, neither adhesions, nor any effusion of serum, lymph, or pus.

Two considerations of indubitable pathological interest arise out of this case; the first is the latency of symptoms due to the aneurysm of the female abdominal aorta. This latency has been frequently noticed in similar cases—very frequently, considering the paucity of such cases; and in reference to this matter, it is not sufficient to fall back for an explanation upon alleged neglect of proper examination—it is more germane to such an inquiry to notice that the female abdomen is wonderfully prone to keep secret the existence of conditions which might be soon discovered in the male. For this peculiarity there are anatomical and physiological reasons which are obvious and unquestionable, and which go to account for the wonderful tolerance on the part of females of a degree of ascites which would in men produce much interference with respiration; to account for the influence of sex in the case of movable kidneys and wandering liver; and for the immense collections of fæces and urine which females can carry about, if not unconsciously, at least with much less inconvenience than the opposite sex are usually able to boast of.

The other consideration is the rarity of this aneurysm in females. In liability to spontaneous or non-traumatic aneurysm the abdominal aorta ranks third, the thoracic aorta being first, the popliteal artery second. This statement is based on Crisp's[a] table of 551 spontaneous aneurysms in both sexes. In these tables there are of the abdominal aorta and its branches 59 aneurysms. Of these 51 were in males and 8 in females. Crisp's collection of cases ended in 1847, and since then I have only been able to add 9 to it. In answer to the question why is this disease so much rarer in women than in men, when carotid aneurysm is equally frequent in both sexes, and dissecting aneurysm more common in females than in males, it is usually said that the alleged predisposing causes of aneurysm—syphilis and intemperance—which lead to the precursory disease of the arterial wall, do not operate so constantly in females as in males, and that from the nature of their habits and occupations females are less obnoxious than males to the exciting causes of aneurysm——such as violent muscular exertion, blows, strains, and injuries of various kinds. Some think that the influence of the periodical loss of blood during menstruation on the vascular system of the female has not been sufficiently considered in reference to the less frequent occurrence of aneurysm in women than in the opposite sex. Admitting that the arteries are equally liable to disease of their coats in either sex, it is difficult to avoid concluding that it is the nature of their habits and occupations which render females less liable to spontaneous aneurysms. Thus, while there is no reason to believe that the popliteal arteries of women, at all events in the lower classes, are less liable to disease of their coats—as far as syphilis or intemperance are predisposing causes—aneurysm of these vessels is so rare in females that Sir A. Cooper[b] saw but eight cases in his practice of forty years.

[a] Diseases of the Blood Vessels. 1847.

[b] Lectures, edited by Lee. 1837. Vol. I., p. 208.

CONGENITAL MALFORMATION OF HEART.

By ARTHUR WYNNE FOOT, M.D., F.K.Q.C.P.;

Physician to the Meath Hospital ; Professor of Medicine, Royal College of Surgeons.

DR. FOOT exhibited the heart of a young man, aged twenty-one, which presented a perforation of the inter-ventricular septum. The communication was formed by a passage about the width of a goose-quill passing downwards and to the right. Its left end commenced immediately underneath the posterior segment of the aortic valve; its right end debouched in the right ventricle underneath a strong moderator band, and in front of the attachment of the postero-internal segment of the tricuspid valve, just below the mouth of the pulmonary artery; the arterial (left) end of the passage was funnel-shaped and smoothly lined by a tough ring of thickened endocardium. The foramen ovale was closed. The coronary arteries were anomalous, inasmuch as both rose above the posterior aortic valve, and these were very unequal in size; the conus arteriosus bulged prominently forwards towards the lumen of the right ventricle.

This lad was in hospital with an attack of rheumatism, the result of a wetting. The day after admission a loud single murmur, systolic in time, was discovered, most audible over the face of the right ventricle, not conveyed along the vessels, unattended with thrill, and distinctly transverse in direction. Five days after admission his temperature rose suddenly, and he became delirious, and he died on the tenth day after admission. It is likely that the murmur, in the absence of valvular lesion, was connected with this inter-ventricular opening. The depression bulging towards the right ventricle would suggest that blood passed from the left to the right

ventricle ; the absence of any cyanosis would be against the view of its taking the opposite direction.

In a case of perforation of the septum auriculorum, shown at the Glasgow Pathological and Clinical Society, there was a systolic murmur observed without valvular disease. It is more likely that this foramen was congenital than due to a tunnelling through a patch softened by myocarditis from the amount of tough fibrous tissue lining the canal. Rokitanski has seen two cases where the ventricle was perforated from myocarditis. It is generally known that the usual seat for congenital deficiency in the septum of the ventricles is the membranous summit of the septum—the part known as the "undefended space." It is the last part of the septum to be developed, and owing to its wholly fibrous or membranous character, it is the weakest part of the septum, and consequently the most frequent starting-point for aneurysms in this situation.

It may also be contended that this was an incomplete form of septal aneurysm.

It is not assumed that the state of things found here was directly concerned with the death.

MALIGNANT DISEASE OF THE STOMACH, PANCREAS, LIVER, &c.

By WALTER G. SMITH, M.D.;
Physician to Sir P. Dun's Hospital.

[Read in the Pathological Section, March 11, 1887.]

PHILIP G., a farmer, aged twenty years, was placed under my care by Dr. De Renzy, of Arthurstown, and was admitted into hospital January 11th, 1887.[a] For the past two years he had been more or less out of health, and had got much worse within the last three months. The first thing which troubled him was heartburn and retching, accompanied by vomiting of a sour reddish-coloured fluid, and inability to retain meat. The retching and sickness were increased by stooping, and he could not bear the jolting of riding or driving. If he ventured to jump or was shaken in any way he felt the sensation as of a weight hanging in his abdomen. He was annoyed by a constant stinging pain, with occasional exacerbations, which he refers to a spot about the centre of the epigastrium. This pain was increased by pressure, and it never varied much in locality. Obstinate constipation has existed for the past two years, the bowels sometimes not acting for a week, and the symptoms are relieved for a time by a free motion. Once he passed blood from the rectum. Increasing severity of his symptoms compelled him to give up work totally about eight weeks ago. He had lost greatly in flesh since he became ill, and a few days before admission slight jaundice was observed. When admitted into hospital he complained chiefly of debility, and of pains in the loins and limbs, as if he had been beaten all over. The left side of the epigastrium was tender, and a hard tumour could be felt; a systolic murmur was heard over the aorta. The liver was enlarged, extending about two and a half inches below its usual limits. The jaundice was slight in degree, and indeed was manifest only in the upper half of the body, which was of a light

---

[a] Notes of the case by Mr. Wilson.

lemon yellow colour. The skin of the abdomen and lower extremities was fair and devoid of icteric tinge.

The urine was scanty, high-coloured, but not turbid, and contained a moderate amount of bile pigment. It was acid in reaction, and presented some unusual characters. When heated, opalescence was produced, not cleared away by a dilute acid, and insoluble in excess of acid, and therefore non-phosphatic. If *dilute* nitric acid or acetic acid were added *in the cold*, a marked turbidity was caused, *not dissipated by heat*, and therefore not due to acid urates. The filtrate from the acidified and boiled urine did not yield any albuminoid reaction. These conditions persisted for days. The spleen was not enlarged, and there was no evidence of distension of the gall bladder, but the epigastric veins and the veins of the right side of the thorax and abdomen were engorged and formed a visible network. No ascites could be detected. He never had rigors, but he was slightly pyrexial upon admission. Two days subsequently the temperature was noted to be 101° F., and remained fluctuating about 99° F., until the day before his death, when it sank to the normal. Nothing abnormal was observed in reference to the heart and lungs.

The case progressed rapidly downwards; the jaundice became rather more marked, and the abdominal pain more intense. He emaciated more and more, the stomach rejected all food, and he had epistaxis. January 21st he passed a melænic stool; the vomited matter contained blood; collapse set in, and he died the next day in great agony, the twelfth day after his admission.

Post-mortem examination.—*Abdomen.*—About a pint of turbid yellow fluid was found in it; no sign of recent peritonitis except a few flakes of lymph over the cæcum. The liver was notably enlarged, smooth on the surface, of an olive buff colour, finely mottled, and presented two small white nodules of new growth upon its upper surface. Anterior edge of falciform ligament occupied by a mass of firm white growth, the pressure of which upon the vein accounted for the distension of the superficial veins observed during life. The walls of the gall-bladder were greatly thickened with new growth; and the cavity, which contained but a little viscid green mucus, was extremely small and somewhat resembled a section of an unimpregnated uterus. Cystic duct completely occluded. Stomach greatly distended and filled with dark grumous fluid. Lesser curvature studded with white nodular growths, but no ulceration of the mucous membrane. The back

S

of the stomach was adherent to the neighbouring organs, and a dense mass of diseased tissue, involving duodenum, pancreas, and kidney, extended back to the right side of the spine. The pylorus scarcely admitted the little finger, and its walls were much thickened, almost cartilaginous in consistence. Just outside the pylorus was a deep oval red depression, not exhibiting signs of ulceration. Walls of duodenum thickened, pale, and œdematous. The rest of the small intestine was dark-coloured and filled with tarry contents. Lesser omentum converted into a solid mass of new growth, about one inch in thickness. Spleen closely adherent to stomach, &c., normal in colour and size. Left kidney adherent to neighbouring organs, healthy upon section. Right kidney normal in size, and upon section showed an irregular mass of white new growth radiating from the hilus into the infundibula. Peritoneal coat of kidney thick, dense, but easily removable. Pancreas closely imbedded in the morbid structures. Portal vein pervious. Abdominal aorta surrounded by a mass of diseased glands, constricting its lumen for about three inches, and thus accounting for the systolic murmur previously noted. Bladder pale and œdematous.

Thorax.—A little yellow fluid in each pleural cavity; no adhesions.

Upper surface of right half of diaphragm studded with a number of white secondary deposits. Over the whole surface of both lungs were seen an immense number of secondary nodules, projecting and flattened at top, and varying in size from the smallest speck to the size of a threepenny piece. Similar nodules were found in the interior of the lungs, starting from the root of the lung and penetrating its substance in radiating streaks. The heart and pericardium were normal, except that the endocardium was slightly yellow.

The occurrence of malignant abdominal disease in a lad so young, the latency of the extensive pulmonary affection, and the condition of the urine, are the chief noteworthy points. I had never before observed the precipitation of a substance of albuminoid properties from urine by the addition of a dilute acid *alone* in the cold.

But, according to Dr. Citron (*Berlin Dissert.*), acetic acid often gives in clear filtered urine a precipitate of a body which shows albumen reactions, and is insoluble in excess of acid. A similar

꙳ body also occurs in true albuminuria, as well as in urines which do not contain the usual albuminoids. Hence a precipitate produced in urine by acetic acid and insoluble in excess need not be referred to mucin even if it do not come from urates (*Berl. klin. Woch.* 3, 1887).

Lastly, as to the origin of the malignant disease in this case, I feel some doubt, but, coupling the clinical history with the morbid appearances, think it most probable that the primary seat of disease was the pylorus. The sections under the microscope, for which I have to thank Mr. H. Earl (Dr. Purser's assistant), are not quite conclusive as to the nature of the disease, sarcoma or carcinoma, but point, I think, to the latter.

A CASE OF FIBRO-SARCOMA OF THE ORBIT.

By H. R. SWANZY, F.R.C.S.;

Surgeon to the National Eye and Ear Infirmary, Dublin.

JOHN M'LAUGHLIN, aged eleven, was admitted to the National Eye and Ear Infirmary, Dublin, on the 8th December, 1886.

History.—His mother states that, about four and a half years ago, she first observed his left eye to be getting larger, and from that time it has been gradually increasing in size. He has never had any pain in or about the eye or head. The sight of the eye became completely obscured about two years ago. He never had any other illness. He has two brothers and three sisters alive, and all of them are healthy with the exception of one brother younger than himself, who has disease of the tibia. Two sisters died as infants.

Present state.—The left orbit is occupied by a tumour, of which the part which projects beyond the orbital margin measures 11 cm. in its equatorial and 11 cm. in its vertical diameter, while its circumference, taken at the orbital margin, is 24 cm. The tumour is spherical in shape, and smooth, not lobulated. On palpation it gives an elastic sensation. The growth fills the orbital opening accurately, and seems to be fixed to its lower margin. At other parts of the margin of the orbit some slight motion can be obtained between it and the tumour. The eyelids are increased in width and in depth so as to cover the whole of this large tumour, as well as the eyeball, with the exception of a portion of the tumour exposed in the palpebral fissure, which latter measures 8·0 cm. long, 3·5 cm. wide. It is, as just stated, a part of the surface of the tumour, covered apparently by conjunctiva, and not the eyeball, which is exposed in the palpebral fissure. The eyeball has

become completely dislocated upwards, and sits on the top of the tumour, as is well shown in drawings Nos. 1 and 2. The drawings are faithful reproductions of photographs.

Fig. 1.

The consensual motions of the globe, especially the lateral motions, are retained to some extent, notwithstanding the abnormal position of the eyeball, and can be observed through the attenuated eyelid. The shape of the eyeball is preserved, although its tension is reduced to $T-2$. There is no power of perception of light. The dimensions of the orbit are enormously increased, and its margin somewhat everted. The left side of the hard palate is a little lower than the right side. The patient has not, and never had, any discharge from the nose, nor epistaxis; and the left nostril is quite free, although pressed on by the tumour. The sensation of the skin of the face, and of the eyelids, is normal.

There are no enlarged glands in the neck, nor signs of secondary growths in other parts of the body. The boy is pale and of slight build, but seems to be in good general health, and, except that he

is careful not to get a blow on the tumour, he enjoys play with others of his own age.

I kept the patient under observation in hospital for three weeks, during which time the tumour increased sensibly in size.

There being some question as to whether or not some obscure fluctuation existed in the tumour, an exploratory puncture with a hypodermic syringe was made, but no fluid was obtained.

Operation and After-treatment.—I proceeded to remove the tumour on the 31st December last, and had the advantage of Mr. William Thomson's valuable aid and counsel at the operation. We were prepared for the securing of large vessels, for the cutting away of bone, and thought it quite possible we might see something of the cranial cavity before the operation was concluded.

Fig. 2.

I first enlarged the palpebral aperture by dividing each commis-sure extensively with scissors, so as to admit of the eyelids being completely reflected upwards and downwards. This exposed the eyeball, which presented a perfectly normal aspect with movable pupil, but with cataractous lens. I then found that owing to a

ligamentous band, which stretched from one to the other, I could not pass my finger at any place between the orbital margin and the tumour. With strong scissors I divided this ligamentous ring all round, and then, pressing my finger between the tumour and the orbital margin, I found I could get it well behind the tumour in all directions; and, with the finger alone, I was enabled rapidly to raise the growth out of the orbit, to the walls of which it was not anywhere adherent. The tumour accurately filled the orbit, so that my finger was tightly pressed between the two as I passed it round and behind the growth. At the apex of the orbit there was some connective tissue and fat, which was detached from the tumour with the scissors. The optic nerve was not seen during the operation. It had probably become atrophied to the size of a fine thread.

Fig. 3.

After the removal, the sides of the enormous orbital cavity—measuring 7 cm. vertically, 6·5 cm. horizontally, and 4·5 cm. in depth—were found to be perfectly smooth and shiny, as though

lined with a tense and tendinous membrane, probably a modified periosteum. The surface of the part of the tumour which had filled the orbit was also perfectly smooth and shiny, as though covered with a serous membrane.

There was very little bleeding. That from a few vessels in the walls of the orbit was easily arrested with the thermo-cautery. The cavity was irrigated with a solution of perchloride of mercury (1 in 4,000), freely powdered with iodoform, and plugged tightly with sponges, the eyelids laid over the latter, and a tight bandage applied. Next day the sponges were removed, and, it having been ascertained that all tendency to hæmorrhage had ceased, I pared off the ciliary margins of the eyelids, and united the cut edges with a few points of interrupted sutures, leaving an opening for drainage at either end. For some days a bit of drainage tube was kept in each of these openings. Good union took place between the eyelids. The cavity was washed out daily through the openings with a solution of perchloride of mercury, and iodoform was blown in.

A week after the operation slight purulent discharge made its appearance, and continued for a month or more, when it gradually ceased, the posterior surface of the eyelids having become adherent to the walls of the orbit. On the day after the operation, the temperature was 101·2°, but it did not again reach 100°, although it kept slightly above normal for three weeks. The third drawing illustrates the condition after healing was complete.

Microscopic examination showed that the growth was a fibrosarcoma, with marked predominance of the fibrous over the sarcomatous structure. It could not be decided with certainty in what tissue the growth originated, but it seems probable that it commenced in the retro-bulbar connective tissue.

TREPHINING IN EPILEPSY.

By W. I. WHEELER, M.D., Univ. Dubl.; F.R.C.S.;
Surgeon to the City of Dublin Hospital.

THE specimens which I show—viz., the brain and calvaria—were taken from a male patient, aged thirty-one, who was admitted into the City of Dublin Hospital on the 26th January this year. He had suffered from epileptic attacks for several years. His history was as follows:—When about thirteen years of age he met with an accident, whilst at play; he fell against the corner of a table, the part struck being the right postero-lateral aspect of his head. Subsequent examination proved that the injury was situated in the region of the lambdoid suture. The immediate effect of this accident was insensibility, which lasted for several hours. From this date he suffered from epileptic seizures, as many as eight or nine in the day, the frequency of which increased till about a year after the accident, when as many as five-and-twenty occurred in twenty-four hours. This state of things continued until he was about seventeen years of age. Soon after the first appearance of the epileptic phenomena, Sir James Simpson was consulted, who recommended trephining, not, however, at the site of injury, but higher up in the region of the lambdoid suture, where a congenital deficiency existed, which will be fully described further on in this communication; it may, however, be here mentioned that his mother attributed the peculiarity of formation in this region to the effects of another fall which occurred when about a year old. During three years he pursued the ordinary avocations of a school-boy, studying diligently as soon as he recovered from the immediate effects of his fall. He then emigrated and led an active outdoor life in the Colonies until he attained the age of twenty-one years, when he returned and married. During

the years of his Colonial life there was a complete cessation of the epileptic attacks. This immunity continued during the first three years of his married life, when he commenced studies in the University of Dublin, where he afterwards graduated. He was repeatedly treated by some of the best-known authorities in London with large doses of bromides, paraldehyde, &c., which gradually produced deleterious effects. During this time he looked forward to taking orders as a clergyman, but he was obliged to relinquish this idea on account of the persistent nature of his seizures, which were daily repeated from one to three or four times. In this condition he consulted me.

Besides telling me the history of his fits, as already related, he complained of pain and tenderness on pressure at the site of the original injury; pressure in this situation brought on sensations as if a fit was about to occur. Having regard to the history I recommended trephining at the site of the injury as the only means which could afford him a fair chance of a radical cure. This operation was performed on Thursday, the 27th of January. On the day before the operation he had two fits, and during the operation he had one. From the time of the operation until he died, which was on the 4th of February, nine days after the operation, there was no recurrence of the fits.

Skull of extreme dolicho-cephalic type; outline of skull presented an abnormal prominence in whole region of superior congenital deficiency; sutures entirely ossified (= synostosis); skull thin over line of coronal suture. A congenital malformation existed in the site of the upper portion of the lambdoid suture of right side, oval in shape, $2\frac{1}{2}$ inches in length and $1\frac{1}{2}$ inches in breadth, covered over by dura mater and a dense fibrous covering continuous with this, but separated by a thick fibrous septum, over which point, during life, great pain was experienced by the slightest pressure, and symptoms as if patient was about to have a fit. On exposing the site of the tenderness and removing the portion of bone now exhibited, a small deficiency was discovered, about one millimetre in width and one centimetre in length, in the cranial wall; it crossed in a line perpendicular to that of the lambdoid suture.

The edges of the aperture were formed by two inclined planes, which, on removing the piece of bone with the trephine, were found to be formed merely by the outer table of the calvarium; so thin were the plates of bone that limited the aperture that both edges broke down completely.

Brain.—On making a section through the corresponding hemisphere of the brain, so as to expose the body of the lateral ventricle, we found that a gum-elastic catheter could be passed backwards from the body of the lateral ventricle into its posterior cornu, and that it appeared at the bottom of the depression already dissected, thus demonstrating the passage of this opening from the surface of the brain into the cavity of the lateral ventricle. On divaricating the edges of the opening in the brain already described, we were able to see the projecting white ridge formed by the outer convex aspect of the hippocampus minor, the identity of which was established by removing the arachnoid and pia mater from the calcarine fissure of Huxley, when, on passing in the handle of a forceps and using gentle pressure, this ridge was seen to bulge inwards.

The experiments of Kussmaul and Tenner have conclusively shown that the part of the encephalon essentially concerned in the production of epileptiform convulsions is the medulla oblongata, with the adjacent part of the pons varolii. Brown-Séquard has gone further and shown by direct experiment that complete epileptiform phenomena may still be produced after ablation of the cerebral hemispheres, together with the entire of the cerebellum. Having regard to these facts, together with the results of their own observations, Ferrand and Vidal have given the name of *nodus epilepticus* to the medulla oblongata, which seems to be the principal factor in the production of these phenomena; this is but what might be naturally anticipated from the presence of the most important of the centres which preside over the animal functions. The presence of a definite convulsive centre has been experimentally demonstrated by Nothnagel, at a level slightly above that of the medulla proper. Although its exact level has not been defined in man, it is presumably placed, as Erb suggests, where the motor nerves of the

antero-lateral columns first terminate in ganglion cells. Reflex irritation of this convulsive centre can be most satisfactorily attained by stimulation of a limited area, symmetrically placed on either side at a little distance from the middle line in the anterior part of the 4th ventricle. Nothnagel points out that there are very often found irregularities of various kinds in the structure of the skull of epileptics, especially if the disease existed from youth, or was hereditary; the most common of these is an asymmetry, more or less strongly marked, which generally shows itself in a slightly-marked paresis of the left side. The bones of the skull are not infrequently much thickened and sclerotic, but by no means always so, and may remain normal, though the disease has lasted for a very long time, while in some other cases they are unusually thin. If now we take, in connection with these, the circumstance that osteo-sclerosis with disappearance of the diploe, also occurs in cases of mental disease existing for years without convulsions, there ought to be no doubt that this represents a resulting condition, perhaps connected with repeated hyperæmias. Other irregularities occur constantly, such as roughnesses of the internal surface, exostoses, &c. Brown-Séquard describes a peripheral epileptogenic zone developed where seizures were produced by artificial lesions, which is so well known to my hearers that I merely allude to it.

REPORT OF REFERENCE COMMITTEE ON THE LOWER LIMB OF A FŒTUS, THE SUBJECT OF TALIPES AND SPINA BIFIDA.

By E. H. BENNETT, F.R.C.S.;

Professor of Surgery in the University of Dublin; Surgeon to Sir Patrick Dun's Hospital.

Dr. E. H. Bennett submitted the Report of the Reference Committee on the lower limb of a fœtus, exhibited by Dr. Macan, which had been laid before them. The dissection of the leg and foot had been conducted by Mr. Scott and Mr. Heuston; that of the joints by Dr. Bennett. The justice of Dr. Macan's observations as to the desirability of having a competent pathologist attached to the Rotunda Hospital was manifest from what happened in the case of this specimen; for, to say the least, it was damaged before it came into the hands of the Committee, so that the efficacy of their examination of it was much impaired. The fœtus was one with a spina bifida, an imperforate anus, and a club-foot. Dr. Macan had already submitted the facts relating to the spina bifida and the visceral deformities to the Society, and only the deformed limb had been referred to the Committee. On examination of the specimen by the Committee the following facts were observed:—The muscles of the calf were normal. There was no evidence of the existence of the tibialis posticus. There was a more intimate attachment than usual between the flexor pollicis and flexor digitorum in the sole of the foot, the flexor pollicis sending a strong tendon to join the flexor digitorum inferior to the ordinary band of junction between those muscles. The sciatic nerve appeared normal, but there was no evidence of its division into peroneal and popliteal nerves, the continued trunk

giving branches to the muscles of the calf, and then passing super-
ficially over the gastrocnemius towards the fibular border, which
it reaches in middle of leg; it was found to divide into two
branches, supplying the peronei, longus and brevis, which are
normally developed. All the anterior muscles are in a rudimentary
condition, the only evidence being a small tendon, evidently the
tendon of extensor longus digitorum. There was no evidence of
the existence of tibialus anticus or extensor longus pollicis muscles.
The lesion would appear to be a non-development of certain nerves,
with subsequently arrested development of the muscles supplied
by them. At the time the specimen was exhibited he (Dr.
Bennett) asked for the reference, because it occurred to him, on
seeing it, that with the malformation of the foot congenital
dislocation of the hip was associated. In order to establish the
existence of congenital dislocation of the hip in a subject so
young, so ill-developed as this fœtus, the opposite hip-joint was
required for the purpose of comparison; but only a portion of the
head of the femur and the capsule on the opposite side was spared
by the dissector of the visceral deformities. There was present,
however, sufficient to prove that congenital dislocation existed on
the deformed side. In the ordinary cases of that dislocation the
gluteal muscles were very small; but in this fœtus there was no
gluteal muscle whatever on the club-foot side. The quadriceps
extensor muscles were developed; but the group of outward
rotators were all absent except the obturator. The head of the
femur occupied a position above and behind that of the opposite
one, resting on the brim of the acetabulum. All the ligaments
of the hip-joint were present; the head of the femur was smaller
than that of the opposite side, and already had begun to assume
the shape seen in the recorded cases observed in the adult; its
epiphysis was otherwise normal; the defect of the muscles of the
gluteal region, as in the leg, was consequent on the failure of the
nerve supply, the nerve cords being damaged in their passage
through the tumour, deforming the spine. This specimen would,
therefore, support the view that the congenital deformity was
induced by nerve lesion.

FIBROMA OF CORNEA.

By ARTHUR H. BENSON, M.A., F.R.C.S.;
Assistant Surgeon, St. Mark's Ophthalmic Hospital.

[Read in the Pathological Section, April 15, 1887.]

On November 5th, 1886, I exhibited to this Section portions of a corneal fibroma, and read the notes of the case in full. I now wish to supplement my previous remarks, and show sections of the tumour which recurred in the same position.

The first tumour was removed, as stated, in October, 1886, and for about two months there was no appreciable recurrence, insomuch that the gentleman in whose service the patient now is, as children's maid, engaged her without knowing that she had suffered from any affection of the eye. A slight nebula was, however, always present, though it was by no means obviously visible.

On January 24th, 1887—that is, about three months after its first removal—she returned to St. Mark's Hospital. The tumour had again formed in the old position, but was much smaller and less elevated than the previous one, and it had square edges instead of circular. With Dr. Story's advice and assistance I again removed it, dissecting it off with the help of Bowman's trephine as before. I then applied some solid nitrate of silver to the exposed corneal surface. There has, since then, been no recurrence of the tumour, but unfortunately the girl did not remain after the operation to have the eye dressed, but went away and stayed away for a week, and when she returned it was with a perforating ulcer of the cornea and synochia anterior, for which she is still under treatment. Histologically, the new tumour seems very similar to the former, both being like ordinary corneal tissue, only opaque. The interest of the case lies in its rarity, most histologists denying that such growths ever occur.

MELANOTIC TUMOUR OF CONJUNCTIVA.

By ARTHUR H. BENSON, M.A., F.R.C.S.;

Assistant Surgeon, St. Mark's Ophthalmic Hospital.

JAMES BOWDEN, aged eleven (Disp., S. M. O. H., 4,734, of March 19th, 1887), first came to see me at St. Mark's Ophthalmic Hospital in 1883. He then had a small, sharply-defined, movable, dark-brown, or nearly black mark in his conjunctiva, close to the corneal border of the left eye. This caused no irritation, and seemed innocent in character, so I advised to leave it alone, telling the boy's father to watch it, and let me see him if it grew any bigger.

In March last (1887)—*i.e.*, after an interval of five years—I again saw the boy. The growth was similar in appearance, but was both larger in superficial area, and raised above the surface of the conjunctiva. The boy's father thought it was growing decidedly of late.

It was now about 8 mm. in length and 3 mm. in its greatest breadth, and followed the margin of the limbus conjunctivæ. Ophthalmoscopic examination under atropine failed to discover any implication of the contents of the globe. The eye was hypermetropic, and vision in it only $\frac{6}{24}$, the right eye being emmetropic and vision $\frac{6}{6}$.

The tumour was easily removed by forceps and scalpel; it was free everywhere except at limbus conjunctivæ, where slight dissection was necessary. The wound healed in a few days, and no appearance of recurrence has, so far, shown since March 19th, 1887.

Histologically the tumour seems to consist largely of fibrous tissue, with masses of sarcomatous-looking cells and a considerable quantity of pigmentation. Much of the pigment is accumulated immediately under the epithelium of the conjunctiva.

FATTY SUBSTITUTION OF THE DORSAL MUSCLES OF THE PIG.

By J. ALFRED SCOTT, F.R.C.S.;

Lecturer on Physiology in the Carmichael College.

THESE specimens were first placed in my hands by Mr. Hedley, F.R.C.V.S., of the Veterinary Department, Dublin Castle. His attention was first drawn to them on account of the unusual and excessive fatness of the pork. A closer examination revealed the fact that the back was very much curved inwards, and that the transverse processes of some of the vertebræ were fractured and had subsequently united, but there was no evidence that the injury had extended as deep as the spinal cord, but in all probability one or more of the spinal nerves were affected by the primary injury or by the growth of bony deposit which formed at the points of fracture. The very fat portion of the muscle was somewhat localised, the muscle five or six inches anteriorly and posteriorly to the seat of injury being normal.

A couple of slices cut at some distance from each other were removed and brought to the Carmichael College Laboratory for further examination.

The most important point in the naked eye appearances presented by these slices, is that a couple of the muscles, the outlines of which can easily be traced, contain an abnormal quantity of fat scattered amongst the muscle substance. In one part the longissimus dorsi, which forms an approximately circular section of about two inches in diameter, is completely changed into fat, only the closest examination showing any trace of muscle; the aponeurosis which covered it, however, still remains, being very marked towards the superior and internal aspect. This fatty

T

muscle appears of a slightly different shade of colour to the sur-
rounding fat; a smaller muscle-bundle, about three-quarters of an
inch in diameter, shows a slightly larger proportion of muscle.

The other slice, taken from the neighbourhood of the lower part
of the scapula, has a portion of the same muscle in which the
change is not so far advanced.

Two other muscles—probably the subscapularis and one of the
rhomboidei—present quite normal appearances—indeed, muscles
showing a larger proportion of intra-muscular fat than those com-
mon in provision shops.

Microscopically, the parts which were formerly muscle were
almost entirely composed of normal adipose tissue, with, scattered
here and there, small bundles composed of one or more muscle
fibres. These muscular fibres were apparently all that remained
of the original large mass of muscle. Each fibre, at some part,
generally presented a more or less normal appearance, but they
gradually became narrower and finally dwindled down to a string
of connective tissue. The transverse striation could be well seen
in the normal parts, and could be traced downwards towards the
atrophied portion, gradually getting fainter as the other charac-
teristics of the muscle-fibre vanished.

The masses of tissue visible after the muscle characteristics are
lost contain generally an unusual quantity of nuclei, which probably
were those of the connective tissue and capillaries, as well as the
sarcolemma of the muscle. Section cut from places where the fat
was not so well marked to the naked eye showed perfectly normal
muscle-fibres, which at some parts were narrowed by fat cells
which lay close to and between them. The fat cells were arranged
in elongated groups of from one to a dozen or more cells.

That this condition is not common may be seen from the fact
that Mr. Hedley has only observed one previous case anything like
it before, although he has examined the carcasses of several hundred
pigs; and on looking up the subject I can find only very ambiguous
references to such a condition in Human Pathology.

Sutton[a] quotes Otto, who wrote about 1831, " that parts devoid

[a] Introduction to General Pathology, p. 85.

of nerves are exceedingly prone to undergo fatty degeneration," and mentions a case[a] where the spinal cord of a fœtus was damaged in utero during the fifth month of pregnancy, and at birth the lower extremities were masses of fat. From the description I am inclined to think that this is a similar case, but he gives no description of the microscopical appearances on which the whole argument turns.

Again, Zeigler[b] states :—" Organs like muscles, which for any reason are left unexercised, and so fail to undergo an adequate amount of tissue change, are very apt to become fatty ;" but this is written in connection with ordinary fatty degeneration.

Cornil and Ranvier[c] state that in infantile paralysis and progressive muscular atrophy, the muscular fasciculi totally disappear in consequence of fatty degeneration.

In order to distinguish this condition from some of those cited above, I have called this a fatty substitution, as the terms degeneration and infiltration imply processes different from that which appears to have taken place here ; and although both these conditions, the latter particularly, are present, the sequence of events in their production does not appear to be the common one.

The first cause was undoubtedly nerve injury ; on account of this the muscle was then probably paralysed, inactive, and wasted, this wasting being caused by the non-growth of the muscles from injury of their trophic nerves, and also by the absorption caused by the pressure of the large quantity of fat deposited in the connective tissue between the muscle-fibres. This growth of fat would also be influenced by the feeding which pigs receive a short while before they are slaughtered, as well as the hereditary fatty diathesis in the modern breeds of pigs.

If any true degeneration occurred some oil granules would be visible in the fibres. In some of the sections, when the substitution had gone on to a considerable extent, a muscle-fibre had some suspicious granules which may or may not be fat, the difficulty of

[a] Med. Chir. Trans., lxviii., p. 393.
[b] General Pathological Anatomy, I., p. 81.
[c] Manual of Pathological Histology, I., p. 443.

deciding being intensified by the method of cutting the sections, which was found necessary from the very fat condition of these parts. I have, however, cut sections in a different manner from portions exhibiting somewhat earlier stages of the disease, and stained them with osmic acid; in these sections I was able to see clearly the fat cells in the inter-fibrillar connective tissue, and that the fibrils were compressed thereby, but there were not any fat granules in the fibrils themselves.

Allowing that the few instances I have mentioned were true degeneration of the fibres, and considering that they were only visible in more or less atrophied portions, I think the true explanation is that some of the last portions of abnormal protoplasm have been removed in this manner, but their absence in the portion where the disease was commencing shows that it was not the primary lesion. Fatty infiltration would not be sufficient to cause the absorption of a healthy muscle; and indeed it will be seen that some of the muscles in the neighbourhood are apparently normal, probably on account of their different nerve supply.

EXPLANATION OF PLATE.

Fig. 1.—Section through advanced portion of disease.

$f =$ Fat.

$a.m =$ Atrophied muscle.

Fig. 2.—Section through part where disease had just commenced.

$o =$ Fat stained by osmic acid.

$m =$ Muscle.

Fig. 1.

Fig. 2.

Dr. Alfred Scott on fatty substitution in Dorsal Muscles of Pig.
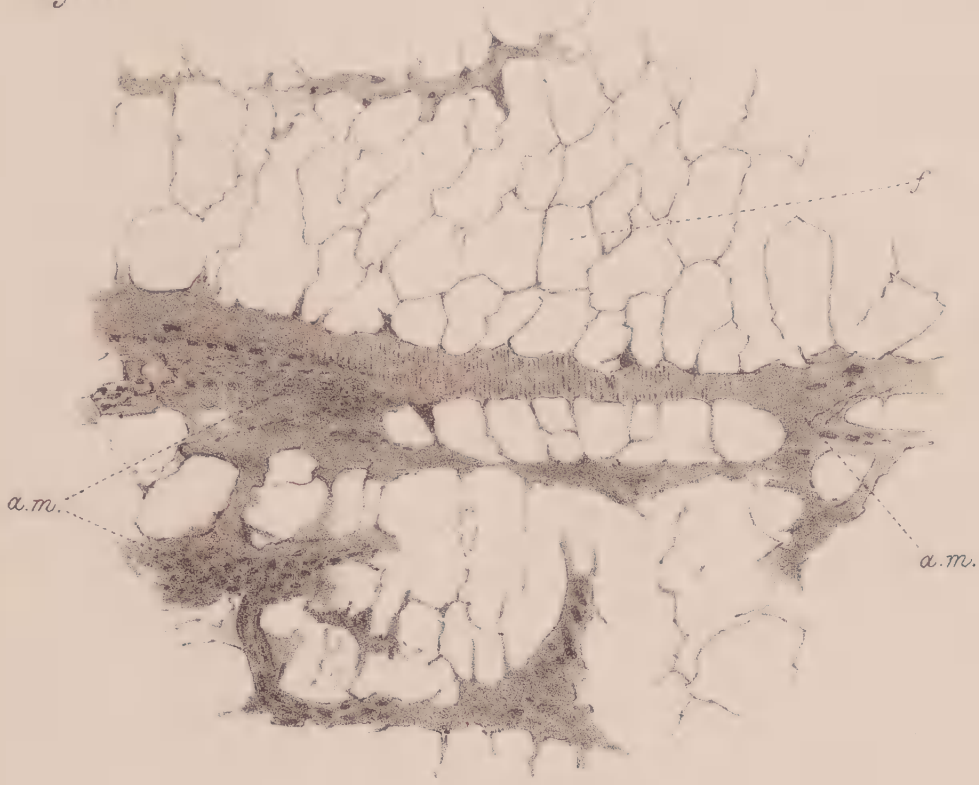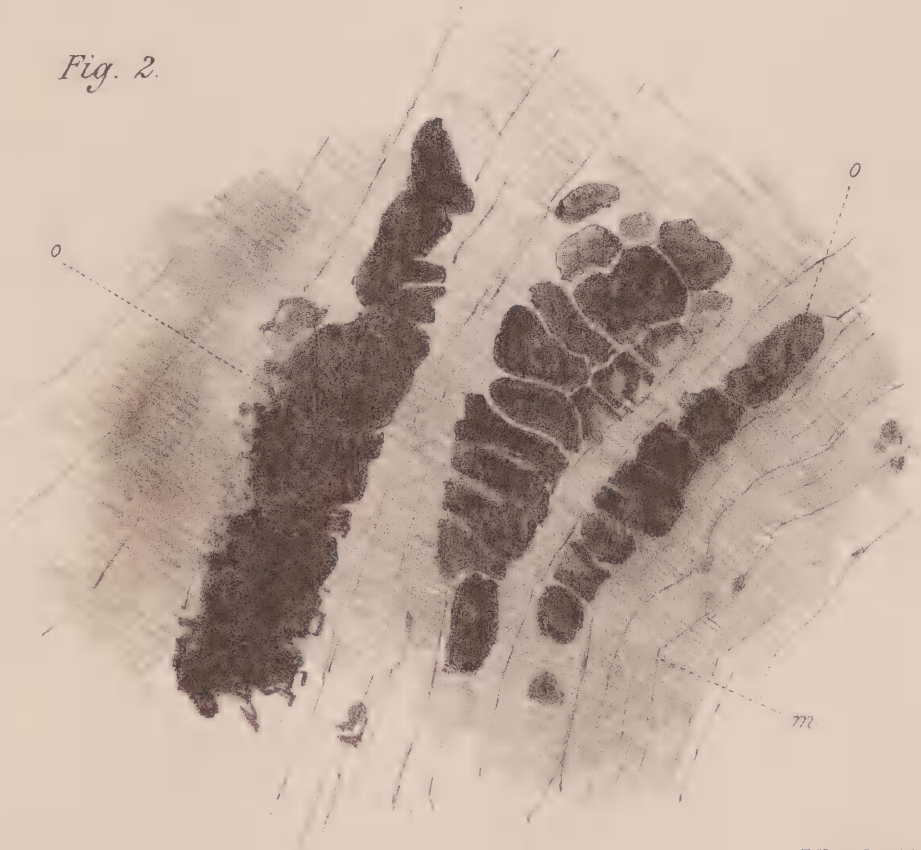
PERFORATION OF STOMACH.

By M. A. BOYD, F.R.C.S.;

Physician to the Mater Misericordiæ Hospital.

THE specimen which I exhibit is the stomach of a girl, aged twenty-three, who died very suddenly from acute peritonitis owing to perforation of the organ on its anterior aspect by an ulcer.

The interest of the case lies in the absence of many of the usual symptoms that accompany gastric ulcer, and the difficulty, in consequence, of explaining the cause of the acute peritonitis that was the cause of death. The girl was fairly well nourished and stout, but anæmic in appearance—the subject of menorrhagia. She complained occasionally of discomfort after food, but no pain, but never vomited blood. She only occasionally vomited her food, and took solids up to the day before her death. The day before her death she went out after dinner; when walking, suddenly complained of sickness and faintness, and intense pain in the abdomen. She vomited after being brought home. The position of the patient in bed, the collapse, the extreme pain and tenderness over the abdomen—all pointed to acute peritonitis. She lingered in extreme pain for 24 hours, relieved somewhat by opiates, and then sank. On opening the abdomen 24 hours after death I had an opportunity of seeing the amount of inflammatory mischief which could be accomplished by 24 hours of acute inflammation of the peritoneal cavity. A large quantity of sero-purulent fluid with gas escaped on opening the peritoneal cavity, and the intestines were glued together by recently-formed lymph. On raising up the left lobe of liver the course of the peritonitis was explained. On the anterior aspect of stomach, nearer to the lesser than the greater curvature, was a small round opening, about the size of a threepenny bit; over the

upper portion of this opening a fringe of omental fat was adhering by some recently-formed lymph, uniting the edge of the liver to this portion of the ulcer, and leaving the lower half of the ulcer uncovered. Through this portion the rupture took place, and some of the fluid contents of the stomach escaped into the peritoneal cavity.

The ulcer, seen from the stomach side, has the usual appearance of gastric ulcers, and seems to have existed for a long time from the induration of its edge, and the amount and extent of this induration explains the reason of the absence of hæmorrhage, though, as can be seen in the specimen, it is surrounded on all sides by numerous large varicose blood-vessels, some of which evidently became involved and obliterated in the inflammatory process. This varicose condition of vessels is, in my mind, very important. When fatal peritonitis results from perforating ulcer of the stomach the anterior wall is the situation where it is most usually situated, and the occurrence of rupture in this situation is easily explained anatomically. The peritoneal floor of an ulcer in such a situation is least supported by adjoining parts, and the continual movement of the diaphragm and abdominal walls prevents the adhesions to neighbouring parts, which so frequently occurs when it is on the posterior wall or along the lesser curvature, and which obviates the tendency to rupture.

Here it might not be inappropriate to consider the cause of gastric ulcer, and why chlorotic females are so frequently the subject of it. A varicose condition of the veins of the stomach similar to that of the rectum, and hæmorrhoids, which, by the way, are a frequent accompaniment of the subjects of gastric ulcer, as well as a varicose condition of the veins of the legs, explains, in my opinion, the occurrence of this ulceration better than any other theory.

On the causation of gastric ulcer Virchow was of opinion that the first step in its formation was an arrest of the circulation of some portion, allowing the gastric acids to exert their solvent action on the stomach walls at this situation when they were deprived of the normal alkaline blood which, in the healthy condi-

tion of the organ, counteracts the effects of its own secretion on
the gastric surface. He proved by ligaturing some of the gastric
arteries the solvent effect of the gastric juice on the parts thus
deprived of blood ; and he considers embolism of the gastric arteries
as the main cause of the formation of gastric ulcers.

Looking at the tortuous and varicose condition of the veins in
this case, as well as of others I have examined, the conviction was
forced on me that varicosity of the gastric veins plays a far more
important part in the production of gastric ulceration than any
change in its arterial supply.

We know that the subjects of gastric ulcer—chlorotic females—
are very liable to hæmorrhoids and to varicosity of the veins of
the legs; and if one tributary of the portal system shows such a
constant condition of varicosity, it would not seem strange that
another—the gastric—should frequently show it also. The rupture
of a gastric vein in such a condition would just form the starting-
point at the point of solution of its continuity for the gastric juice
to act on the abraded part, lowered in its vitality by containing a
stasis of its blood supply, and that a venous one. In early hæma-
temesis, before decided symptoms of gastric ulcer show themselves,
the blood vomited is generally venous, which still further supports
this view.

MALFORMATION OF THE SHOULDER-JOINT.

By E. H. BENNETT, F.R.C.S.;

Professor of Surgery in the University of Dublin ; Surgeon to Sir Patrick Dun's Hospital.

DR. E. H. BENNETT exhibited a specimen of malformation of the shoulder-joint. It was a form of malformation or disease that he had never seen before; and the only way in which he could read it was that it was not congenital, nor the result of a fracture or dislocation, but a condition brought on by the action of a burn, the cicatrices of which existed on the limb and near the joint. The limb belonged to a slender man of middle age. It was dissected in the School of Physic, and had previously attracted attention in consequence of deformities that appeared in the fingers, the result of burn contractions. The little finger was turned towards the ulnar side, and its extremity had been lost; and the finger next it had suffered similarly, but to a lesser degree. The cicatrices were not such as to produce large webs or great deformities, but the end of one finger was completely destroyed, and there were marks upon the limb of burning of the skin. These were the only circumstances that threw light on the question of the cause of the deformity. It was noticed before the dissection was made that the shoulder-joint, although not completely fixed, was limited in its range of motion. There was nothing abnormal in the muscles, except that those of the dorsum scapulæ were to some extent wasted; all the muscles were, however, otherwise good. The condition of the shoulder-joint was curious. On clearing away the soft parts on the outside of the joint, he found what at first sight appeared to be the head of the humerus directly underneath the muscles, without any capsule, while the upper part

of the humerus was distorted and bent. There was no disease of the scapula or glenoid cavity; on the contrary, everything there was normal. The length of fibrous capsule was very small. The appearance, as of a head of the humerus, which the specimen presented, looking at it from the outer side, was fallacious. On turning the specimen it was seen that the head of the humerus was half buried in an ossified capsule; while the remaining half of the capsule was free, soft, and flexible, and received the attachments of the capsular muscles normally on the axillary side. There were no deep cicatrices involving the muscles; and the tendons and joint had been in no way affected except by the skin contraction. It was hard to account for this condition of the capsule and the extraordinary limitation of the ossification of it to the outer side. On the inside the cartilage of the joint was perfectly normal. He had not made any section through it, because he did not think it would reveal much. The head of the bone was greatly distorted in position. He did not think there had been any fracture of the bone, but believed that the flexion of the upper part of the bone and distortion of its head had been produced by the limited range of movement resulting from the superficial cicatrices.

FRACTURE OF THE SKULL, WITH LACERATION OF THE BRAIN.

By FRANCIS T. HEUSTON, M.D., F.R.C.S., M.Ch.;

Surgeon to the Adelaide Hospital ;
Lecturer on Anatomy, Carmichael College of Medicine and Surgery.

[Read in the Pathological Section, May 13, 1887.]

THE history of the case from which the specimens I now bring under your notice (as furnished me by Dr. M. A. Boyd, under whose observation the patient came) is as follows :—

CASE.—Mr. R. T., aged sixty, on Wednesday, April 27th, 1887, fell from a window of his house into the flagged area, a distance of twelve feet, on his head. When seen by Dr. Boyd immediately after the accident, he was found sitting on the ground, and stated that there was nothing the matter with him. After a few minutes he rose and entered his house, when it was found he had no recollection of having fallen, but complained of pain in his head, on which a contusion of the right occipital region, about two inches in diameter, existed. When seen later in the day he still had no recollection of having had an accident, and was slightly confused, but otherwise appeared to be in his normal condition. For the two following days he continued in much the same state, but was commencing to become troublesome to manage, as he insisted on going to a public-house near his residence to obtain drink; and whilst in the house he was continually wandering about. From the third night subsequent to the accident he was unable to sleep ; and as his restlessness continued to increase, his friends expressed a wish that he should go to the Adelaide Hospital, where he was admitted on Tuesday, May 3rd, but he became immediately very unmanageable, and as he refused to remain in the hospital his friends thought it better to again remove him home, he not having been seen by any of the hospital staff.

On May 4th he began to talk incoherently, and became so unmanageable and irritable that he was seen by Dr. Banks, in

consultation with Dr. Boyd, when the following condition existed :—
He spoke rationally, and complained of a pain down his spine,
with some weakness on standing and tenderness at the situation
of the contusion on his scalp. The pulse and temperature were
normal; otherwise there were no symptoms to indicate serious
injury.

Saturday, May 7th.—On this morning his speech was noticed to
be thick, and he was unable to use his left hand or leg. When
seen by Dr. Boyd on this evening he had incomplete hemiplegia
of the left side, involving the left side of the face and soft palate;
he was, however, able to move his left arm, and could stand by
himself, although showing a tendency to fall backwards. His
speech was thick and voice nasal, but he answered questions
rationally. There also existed slight convergent strabismus of the
left eye; the pupils were equal, and he could close his eyes per-
fectly; in addition, he suffered from a cough, with an accumula-
tion of mucus in the pharynx; he had perfect control of his
sphincters.

He was removed to the Adelaide Hospital at 10 30 p.m., where
he died at 11 p.m., evidently from paralysis of the muscles of
respiration.

Sunday, May 8th.—Assisted by Dr. Boyd, I made a *post-mortem*
examination, when the following condition was found to exist :—
The scalp presented a contusion corresponding to the right parietal
bone, immediately anterior to the lambdoid suture, an inch and a
half in circumference. On the removal of the scalp an extravasa-
tion of blood was found to exist extending antero-posteriorly from
the external angular process of the frontal bone to the median line
of occiput, and vertically from the saggital suture to the level of
the fissure.

On examining the skull a fracture was seen occupying the
posterior portion of the right parietal bone, extending for an inch
and a half in the course of the lambdoid suture from the pos-
terior inferior angle of the parietal bone; it then continued for
an inch and a quarter in direct continuation of the last-mentioned
fissure, thus invading the parietal bone; it now extended forwards
and upwards at a right angle for an inch and a quarter, and then
proceeded directly downwards for two inches, from the inferior
extremity of which it proceeded downwards and forwards to the
parieto-mastoid suture, the bones of this suture being loosened.
From the two superior angles described above fissures proceeded

backwards for about three-fourths of an inch. The portion of the parietal bone included between the above lines was divided by two parallel transverse fissures, the upper cutting off about a sixth of the whole, the lower dividing the remainder equally; this upper fragment was somewhat depressed, while the two inferior fragments were raised at their junction to the extent of one-eighth of an inch. Subsequently, when the brain was removed, a fracture was seen to extend from the posterior inferior angle of the parietal bone, along the masto-occipital and petro-occipital sutures, to terminate in the foramen lacerum posticum, while at three-eighths of an inch from the inferior extremity of this fracture a fissure extended into the foramen magnum, through the occipital bone, immediately posterior to the condyle.

When removing the calvarium by the usual incision, a large quantity of cerebro-spinal fluid exuded, followed by some thick blood from beneath the position of the fracture.

On removal of the calvarium a clot was found to exist between the dura mater and the bone, occupying the position of the fracture, into the line of which the posterior branch of the middle meningeal artery extended. The dura mater being removed, a clot was to be seen on the surface of the brain, which was found to conceal a laceration of the brain at the junction of the temporo-sphenoidal with the occipital lobe, which laceration extended obliquely upwards and backwards, being one and a quarter inches in length and one half inch in breadth, thus occupying the brain from the second to the fourth annectant convolutions. On subsequent examination this laceration was found to extend into the brain to the extent of half an inch, but did not communicate with the lateral ventricle of the brain.

On proceeding with the examination it was found that the lateral sinus, although crossing the line of the fracture, was not injured, and that there existed a clot continuous with that found beneath the fracture, and situated between the dura mater and the bone, which completely filled the right posterior fossa of the skull; in the right posterior fossa there was also to be seen a laceration of the dura mater, about an inch in length, passing in an antero-posterior direction, the anterior extremity being close to the lateral sinus.

The inferior aspect of the cerebellum presented a laceration filled with a clot; this laceration, which was half an inch in length and three-sixteenths of an inch wide, was situated in the biventral lobe.

I consider the above case as worthy of record, it presenting the following very interesting points :—

1. The extensive skull and brain injury which existed in connection with such slight primary symptoms.

2. The length of time the patient lived after the injury (ten days).

3. The tilting of the broken fragments of the skull.

4. The subsequent development of paralysis, probably due to the intra-cranial effusion and cerebral congestion.

5. The probable result of surgical interference in such a case.

FRACTURE OF THE ISCHIUM.

By E. H. BENNETT, M.D., F.R.C.S.;

Professor of Surgery in the University of Dublin ; Surgeon to Sir Patrick
Dun's Hospital.

FRACTURE of the ischium only is one of the rarest injuries of the
pelvis. In the American War Reports I find recorded seventy-
three examples out of eleven hundred and fifty cases in which the
special bone of the pelvis is specified. But in civil practice the
injury is of extreme rarity; one of the most recent writers on
fractures (Packard in " Ashurst's Encyclopædia") speaks of the
six cases collected by Malgaigne as " being the only ones known."
Many of our present standard authorities on fractures are silent;
and at the most a diligent search has not enabled me to find more
than two or three cases since the date of Malgaigne's publication.
I exclude, of course, from this category cases of fracture of the
brim of the acetabulum occurring as a complication of dislocation
of the femur. In the study of Malgaigne's cases, and those since
recorded, I find no mention of *post-mortem* examination having
verified the details of the injury except in one instance; this fact,
taken with the comparatively small mortality rate observed, even
in gunshot fractures of such gravity (42·4 per cent,), proves the
injury to be one which entails but a small amount of risk.

I do not know that there is any specimen of the united fracture
preserved anywhere. I am glad, therefore, to be able to exhibit
this fine example to the Academy, even though I cannot give with
it any life-history.

Last winter my attention was directed to a subject being dis-
sected in the School of Physic—an aged male body whose hip was
deformed. Already the dissection had been conducted for some

F. Huth, Lith.ʳ Edin.ʳ

Fig. 1.

Fig. 2.

DR. E. H. BENNETT ON FRACTURE OF THE ISCHIUM.

Fig. 3.

DR. E. H. BENNETT ON FRACTURE OF THE ISCHIUM
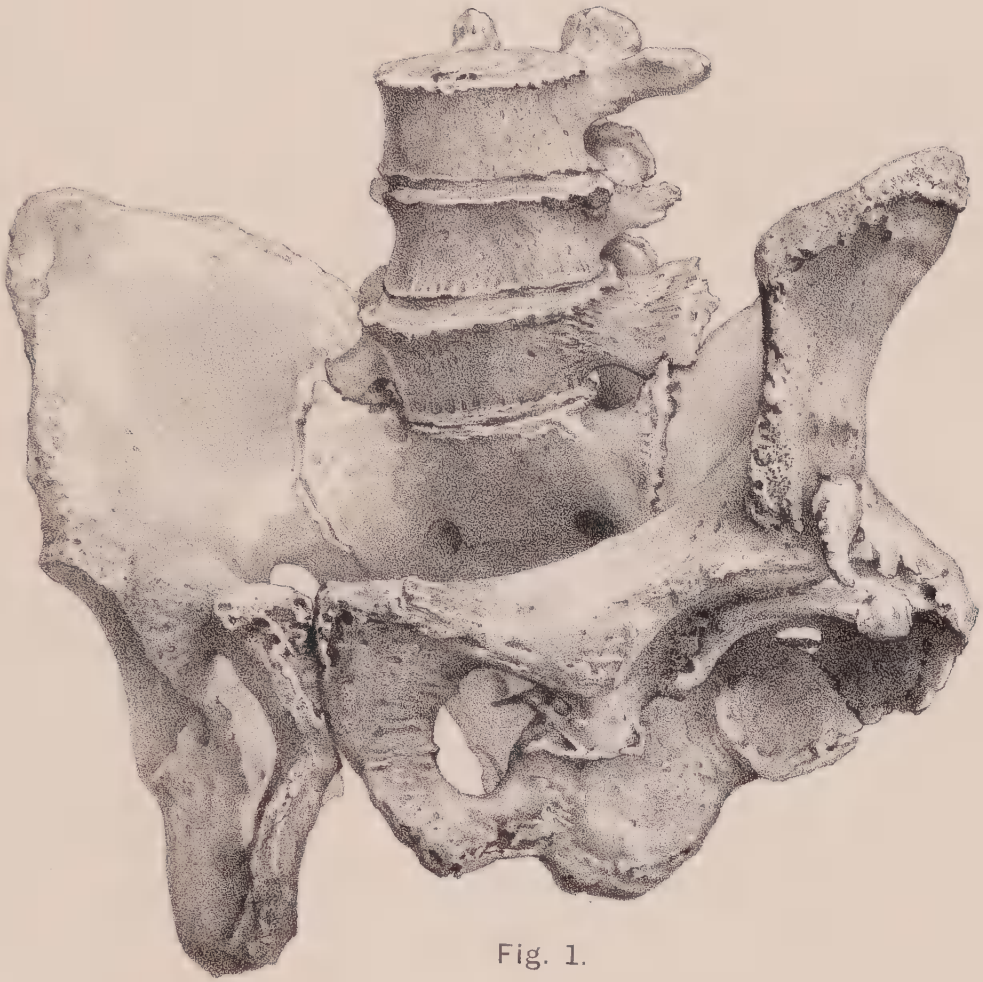
time, so I could judge but little of what the exact details of the deformity of the undissected limb had been; only this was certain, that there had been seen no traces of abscess having existed at any time, nor any wound of the skin. The limb was placed in the attitude of dislocation, with moderate shortening and adduction of the limb with inversion of the foot, and the hip-joint preserved a very limited range of motion. Unable to decide at once whether the condition of the joint was the result of injury, or of morbus coxæ, I deferred my judgment until maceration should disclose the exact condition of the bones. I think that an examination of the specimen leaves no doubt that injury alone could have produced the changes it presents. The entire pelvis being preserved, it is seen that the lesions present are confined to the left hip-joint and to the ischium; there is neither fracture nor disease of the remaining divisions of the left innominate nor of the other pelvic bones.

The ischium is detached from the left innominate by fracture, which has traversed the junction of the bone with the ilium and pubis in the acetabulum and with the descending ramus of the pubis. So detached, the bone has been displaced backwards and upwards—a displacement that appears to have been limited by the ramus ischii catching against the pubic margin of the acetabulum (Figs. 1 and 4); in this position the ramus is united both to the pubis, where it forms the superior limit of the notch of the acetabulum, and to the descending ramus of the pubis; the ramus ischii fills up the lower angle of the obturator foramen.

Posteriorly (Fig. 3) the ischium is thrown across the great sciatic notch, which is reduced to a narrow slit just capable of transmitting the great sciatic nerve only; the displaced bone is united to the side of the sacrum and to the posterior inferior spine of the ilium, while there is just room for the passage of my index finger between the apex of the spine of the ischium and the border of the sacrum near its apex.

In this placement the head of the femur participated, and it rests much in the position commonly assigned to it in dislocation into sciatic notch. An arch of bone is thrown over the displaced femoral head, and forms a cup for its support, developed in the fibres

of the torn capsular ligament (Fig. 4). This arch rests on the upper fractured surface of the displaced ischium behind, and is supported in front by the ilium along the surface that normally attaches the capsular ligament of the hip. The outline of the iliac and pubic portions of the acetabulum can be traced, but all signs of their articular cartilage is gone, and the socket formed for the head of the femur seems to have been moulded to fit it exactly, except in one place. Here (Fig. 2), directly in front, the displaced head rested against the fractured surface of the ilium, and has suffered by the pressure, having a large piece absorbed from its structure and from the upper part of the neck, so as to let it move in its new site.

Singularly little change is seen on the inner aspect of the pelvis except what results from the displacement of the ischial fragment of the innominate bone; the line of the fracture is distinct, and the encroachments made on the great sciatic notch, on the obturator foramen and on the diameter of the lower outlet of the pelvis are evident, but no exuberant growth of bone, such as is developed outside to form the new socket for the femur, exists.

In view of these details, I am confident in the correctness of the diagnosis of fracture of the ischium with consecutive dislocation of the femur.

Fig. 4.

DR. E. H. BENNETT ON FRACTURE OF THE ISCHIUM
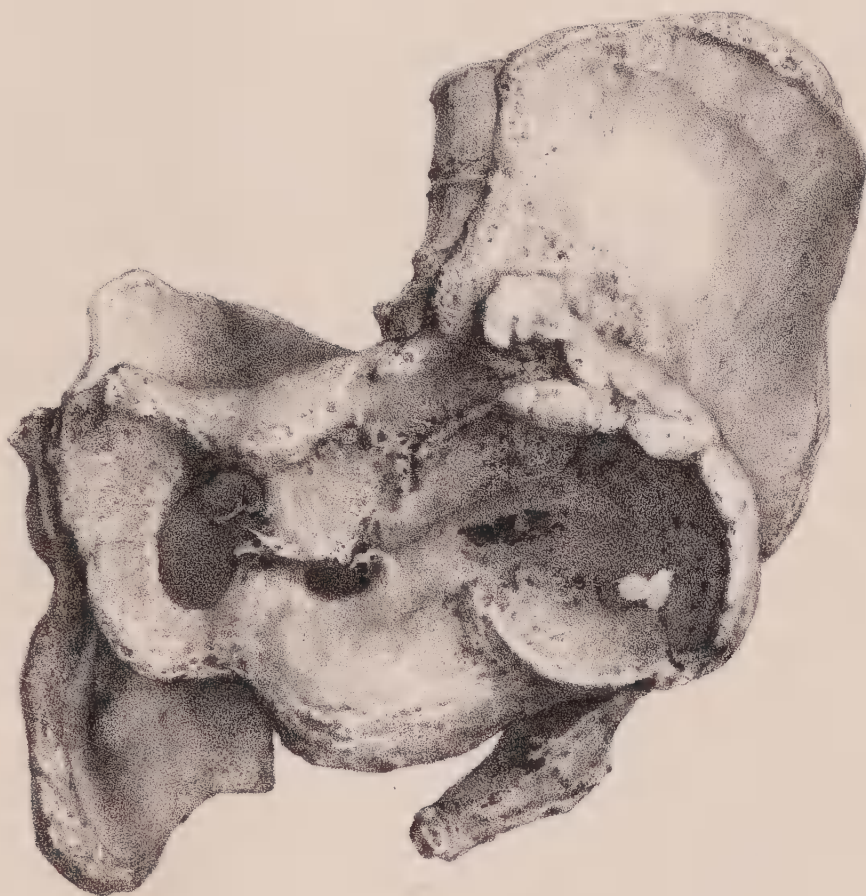
SUB-SECTION OF STATE MEDICINE.

ON THE CLEARANCE OF AN UNHEALTHY AREA, UNDER THE PROVISIONS OF THE PUBLIC HEALTH ACT.

By SIR CHARLES A. CAMERON,

Ex-President and Professor of Hygiene and Chemistry, R.C.S.;
Superintendent Medical and Executive Officer of Public Health for Dublin.

[Read in the Sub-Section of State Medicine, February 3, 1887.]

A SURVEY of the houses in the city of Dublin, which I carried out in 1882, showed some startling facts. I found that whilst 54,725 families, comprising the population of the civic districts of the metropolis, occupied 24,211 houses, no fewer than 32,202 of those families resided in only 7,234 of the houses, leaving 16,977 houses to be occupied by 22,523 families. The 7,234 houses contained 48,116 rooms, or an average of $1\frac{1}{2}$ rooms per family. In many of these houses the number of families was from 10 to 12, some of them, occupying a single apartment. A large proportion of the houses were originally occupied by single families, and were not, therefore, designed as tenement houses. There is, however, one advantage in connection with houses of this class—namely, the large size of the rooms and their airy stairs and lobbies. On the other hand, they are more or less dilapidated, having cracked walls, worm-eaten floors, rickety stairs, bad roofs, ill-paved yards, and defective sanitary accommodation. Notwithstanding the poor accommodation which those houses afford, the rents extracted from their poverty-stricken tenants are, I am certain, higher than in other large towns. I find that the valuation for taxation purposes of the 175 houses in Jervis-street, North Cumberland-street,

U

the specification and estimates, &c., and may support his objections personally before the Local Authority. The latter, on hearing the objections, may refuse to entertain them or not, as he thinks fit. For the second time the owner may appeal to the Court of Quarter Sessions, and a further appeal, or a statement of facts to the Court of Queen's Bench, is permitted.

When the questions in reference to the necessity of remodelling, &c., the premises have been settled, the owner must be called upon to do the necessary works. If there are several owners, then they are to be called upon in the order of title. If the owner's residence cannot be ascertained, due notice must be served upon the occupier or posted on the premises.

When the owner fails to execute the work, the Local Authority may do it, and obtain from the Court of Quarter Sessions an order charging the premises with all the expenses incidental to the improvements, together with interest at the rate of 4 per cent. per annum on the money expended; the charge upon the premises is to have precedence over all others.

In case the premises are to be demolished and not repaired, the owner is to be called upon to do the work, and should he fail to comply with the order, the Local Authority may do the work, and sell the old materials to reimburse itself for the cost of the operation.

The person who on the order of the Local Authority makes any improvement in premises is entitled to a " charging" order upon them to the extent of £6 per cent. on the sum expended. The expenses of executing the Act may be defrayed out of a local special rate, which is not to exceed 2d. in the pound, and a loan for the purposes of the Act may be procured.

The difficulties in the carrying out of the section of this Act dealing with ruinous and unhealthy buildings are very great. In the first place, the processes are very slow. The Medical Officer makes a report that a house is unfit for human habitation. The Sanitary Authority considers this report, and directs the Surveyor or Engineer to make an examination of and report upon the premises. This report has next to be considered by the Sanitary

Authority. One month will at least be required for all these pro-
cedures. A notice is next served on the owner; then he has to
attend before the Sanitary Authority to state objections, if he have
any, against the opinions of the Medical Officer and Surveyor.
The duration of the period of the notice is not mentioned in the
Act, but a fortnight's notice would not be too much.

The next step is the preparation of plans and of estimates. Two
or three weeks would at least be required for this purpose. A
notice is served on the owner that the plans are ready for his
inspection, and may be seen during a period of three weeks. He
may appeal against the order of the Sanitary Authority, and the
appeal may not be heard for months. One month after the decision
of the Court of Quarter Sessions, or three after service of the
order, the owner is to state whether or not he is willing to execute
the works. If he neglect or decline to do the work, a notice that
he is to execute them within two months is served upon him, and
if he still fail, and there be another owner secondary in title,
a similar notice is served on him; and in this way every person
having a beneficiary interest in the premises must get two months'
notice. In by far the larger proportion of the houses in Dublin
there are as many as from three to six separate vested interests.
After all these processes, which probably would occupy from one
to three years—depending on the number of interests to be dealt
with—the Sanitary Authority might themselves execute the work.
The Court of Quarter Sessions must then be applied to for an
order charging the costs of the proceedings upon the premises.

Supposing that the Sanitary Authority has rebuilt the defective
premises, then an order must be obtained from the Court of
Quarter Sessions charging the expenses incurred upon the premises,
together with 4 per cent. interest. This charge is to have priority
over all others.

Under the provisions of the amending Act of 1879, the owner
of premises which have been rebuilt or repaired by the Sanitary
Authority could compel it to purchase same. He will be sure to
do so in all cases where the rent obtainable from them is not
sufficient to pay the interest on the money expended by the

Sanitary Authority, and the head-rent of, and any other charges that may be on, the premises. On the other hand, if the rent pay fully the cost of rebuilding, the owner will keep possession of them. When the Sanitary Authority acquires possession of premises, instead of being allowed to keep and make the most of them, it is obliged to sell them at once, and pay over to the owner any sum which it may receive in excess of the amount expended by it to the owner; but this defect of the Act has been remedied by the Housing of the Working Classes Act of 1885.

The 75th, 76th, 77th, and 78th sections of the Towns Improvement Act of 1847 (10 & 11 Vict., c. 34) enable the Sanitary Authority to deal with ruinous and dangerous houses, walls, &c. These provisions apply only to houses, &c., which are likely to fall and injure persons. I think that the Towns Improvement Act, which is incorporated with the Dublin Improvement Act, 1849, is a better one to apply to ruinous houses than the Artisans' and Labourers' Dwellings Act. Supposing that a house which, having been closed as unfit for habitation on the action of the Sanitary Authority, is allowed to become ruinous, then it may be assumed that it is likely to fall. A notice to take down, secure, or repair such premises within three days is served on the owner, or, if he cannot be found, it is posted on the premises. If the owner fail to comply with the notice, the Police Magistrates may, on application, make an order to have the work done within a specified time. If the owner again fail, then the Sanitary Authority may put the house into repair, or rebuild it. The expenses incurred, if not paid on demand, may be recovered by a warrant of distress issued by the Police Magistrate. Lastly, if the distress cannot be effected, the Sanitary Authority may, after giving 28 days' notice, take possession of the premises, which, being valued, the owner is to be compensated for any interest he may have in them, after the cost of repairs has been deducted. It would, I think, rarely happen that the owner would get anything in the way of compensation. Whatever he would be entitled to should be determined under the provisions of the Lands Clauses Consolidation Act of 1845. The Sanitary Authority appears to be unfettered as regards the disposal

of the premises, as the Act states that it may "sell or otherwise dispose of said buildings or land." I think, then, that if any action is to be taken in relation to ruinous houses, our own local Act is incomparably superior to the Labourers' and Artisans' Dwellings Act. It is quicker in operation, simpler in its provisions, and requires very little law procedure.

The Corporation of Dublin have cleared two unhealthy areas under the provisions of the Artisans' and Labourers' Dwellings Act. The first cleared is that known as the "Coombe." The ground cleared contained 202 houses, inhabited by 984 persons, and situated on an area of 4 acres and 36 perches. The total cost of the clearance amounted to £24,367 12s. 10d., or at the rate of £5,769 9s. 9d. per acre. The cleared ground was let on lease for ever to the Dublin Artisans' Dwellings Company, at a rent of £200 a year. If this rent be capitalised at 25 years' purchase, at 4 per cent., the sum would be £5,000. The net cost of the clearance was, therefore, £19,367 12s., or at the rate of £4,840 1s. 1d. per acre, or at the rate of £19 13s. 8d. per head of the population of the area.

The second district cleared is that known as the Plunket-street area. It comprised 3 acres 2 roods and 22 perches, upon which there were 159 houses, occupied by 1,619 persons. The gross cost of the clearance amounted to £32,332 14s. 1d. The site has been let (chiefly to the Artisans' Dwellings Co.) at £190. Capitalising this rent at 4 per cent., 25 years' purchase, the cost of the scheme is reduced to £27,582 14s. 1d., or at the rate of £7,582 17s. 6d., being £17 0s. 9d. per head of the population of the area.

Thus it will be seen that the unhealthy areas cleared contained 7 acres 3 roods and 18 perches, and was inhabited by 2,603 persons. The clearance cost at the rate of £5,971 per acre.

I have now to describe a clearance which I have effected, upon a small scale no doubt, but still without cost to the ratepayers. It includes nearly the whole of Wood-street and Arthur's-lane, and a small part of Oliver's-alley. The population in this district was very dense, and the houses were very old and insanitary, and were the constant abode of zymotic diseases. An account of the popu-

lation of Wood-street, Arthur's (formerly termed Maiden)-lane, and
Oliver's-alley, is given in the Rev. James Whitelaw's "Essay on
the Population of Dublin," from his own survey made in 1798.
The following are his figures :—

Wood-street.

HOUSES.				
Inhabited	Waste (? Vacant)	Males	Females	Total
61	1	198	276	474

Maiden (Arthur's)-lane.

14	0	70	87	157

Oliver's-alley.

1	–	8	2	10
76				641

Dr. Grimshaw, Registrar-General, has kindly furnished me with
the population returns for these places according to the Census of
1871 :—

					Population
Wood-street	-	-	-	-	315
Arthur's-lane	-	-	-	-	119
Oliver's-alley	-	-	-	-	13
					447

These figures show that the locality was not so congested in
1871 as in 1798.

In 1881 I commenced an onslaught upon the houses in Wood-
street, Oliver's-alley, and Arthur's-lane. They were all in tene-
ments, and with few exceptions were in possession of middlemen
or persons who take by lease or otherwise houses for the purpose
of subletting them in weekly tenancies. These middlemen were, as
a rule, unable to put the houses into a proper state of repair, and
they were too poor to be able to pay their rents to their landlords
when the houses were closed by magistrate's order. The owners
of the houses would not put them into a proper state either. One
after another nearly all the houses were detenanted and closed,
and soon they began to become ruinous, and ultimately, with two

exceptions, had to be razed. The houses thus disposed of in Wood-street numbered 23 ; in Arthur's-lane, 11 ; and in Oliver's-alley, 1—total, 34 ; or, including 5 houses also demolished in the adjacent Golden-lane, 39 houses.

There are still remaining in Wood-street Nos. 18, 19, 20, 21½, 24, and 32, which at present have a population of 75 persons ; Nos. 1, 2, and 4 Arthur's-lane give shelter to 14 persons ; and 1 house in Oliver's-alley to 5 souls—total, 94 persons. The persons now residing in these places number 353 less than in 1871. The ground actually cleared is a little over a statute acre, and is fairly compact for dwelling purposes.

I have now shown that an acre of unhealthy houses, so to speak, has been cleared without cost to the ratepayers, whilst the clearances under the Artisans' and Labourers' Dwellings Act have cost £6,000 per acre. This work has been done by making use of that part of the 107th section of the Public Health Act which defines as a nuisance "any premises in such a state as to be a nuisance or injurious to health"—a simple definition which leaves everything to the discretion of the magistrate, for should he consider the evidence satisfactory, he can act under the 113th section, which provides that "where the nuisance proved is such as to render a house or building in the judgment of the court unfit for human habitation, the court may prohibit the using thereof until in its judgment the house or building is rendered fit for that purpose."

The lesson which the Wood-street clearance teaches is this :—It is possible, by vigorously enforcing the provisions of the Public Health Act to unhealthy dwellings, to clear with comparatively little cost to the ratepayers unhealthy areas on which the houses are unquestionably unfit for human habitation. No doubt such a procedure must often entail loss, not easily to be borne, on the owners or leaseholders of these unhealthy houses. Still, if a man owns a highly-diseased carcase of cow, or a quantity of mouldy flour, he must submit to have them destroyed as unfit for human food ; so also must those who own unhealthy dwellings submit to have them closed until rendered fit for human habitation.

ON THE PREVALENCE AND DISTRIBUTION OF PHTHISIS AND OTHER DISEASES OF THE RESPIRATORY ORGANS IN IRELAND.

By THOMAS WRIGLEY GRIMSHAW, M.A., M.D. (Dubl.) ;

Fellow of the King and Queen's College of Physicians ;

Registrar-General for Ireland.

[Read in the Sub-Section of State Medicine, May 19, 1887.]

In a paper on the relative prevalence of disease and death-rates in town and country districts of Ireland (read before this Sub-Section on April 16, 1885), I pointed out, among other matters, what an important element phthisis and diseases of the respiratory organs constituted in these relations.[a] In the decennial summary of marriages, births, and deaths for the years 1871–80, issued by the General Register Office of Ireland, I remarked that phthisis or pulmonary consumption, considered as a single disease, is the most potent cause of death in Ireland, constituting, as it does, the cause of more than one-tenth of all the deaths registered in Ireland during the decade.[b] No other disease, except bronchitis, in any way approached consumption in its destructiveness in this country. I then proceeded to point out the difficulty of separating this disease from other diseases of the respiratory organs when making statistical deductions. The total number of deaths registered in Ireland during the decade 1871–80 was 966,745. Of these, phthisis caused 103,528, or more than *one-tenth*. Other forms of

[a] Observations on the Relative Prevalence of Disease and the Relative Death-rates in Town and Country Districts of Ireland.—Transactions of the Academy of Medicine in Ireland. Vol. III., p. 382. 1885.

[b] Supplement to the Seventeenth Annual Report of the Registrar-General of Marriages, Births, and Deaths in Ireland, containing Decennial Summaries for the years 1871–80. Presented to Parliament by Command of Her Majesty. Dublin : Alexander Thom & Co., Limited. 1884.

disease of the respiratory organs, 142,991, or over *one-seventh.* The two groups taken together caused 246,519 deaths, or more than *one-fourth* of all the mortality of Ireland. It is, therefore, quite clear that in dealing with questions of the distribution and pre-vention of disease in Ireland, by far the most important element to be taken into account is that of lung disease.

As I have already pointed out, there is a considerable difficulty in dealing with phthisis as distinct from other forms of lung disease. At the same time, I am of opinion that the data in my possession are sufficiently substantial to found upon them some useful investigations as to the conditions which seem most or least favourable to the spread of these forms of disease. In the decennial summary already referred to, I pointed out how much more prevalent these diseases are in town than in country districts, but neither in that report nor in the paper and report above did I go into detail regarding their distribution in Ireland.

In the present paper I propose to discuss the distribution of phthisis and of diseases of the respiratory organs other than con-sumption. A detailed examination shows that the distribution of these two groups of disease (for we may almost call phthisis a group) is by no means the same. I am quite aware of the difficulties which beset this investigation. It is only through the statistics of mortality that we can form an idea of the distribution of disease in this country, inasmuch as we have no reliable record of the prevalence of non-fatal disease. In using mortality statistics as a guide to the distribution of disease, we meet with the following difficulties :—1. Some of the deaths are not registered. This, however, is not a matter of much consequence, as the total number of unregistered deaths is small. 2. In a considerable number of cases the causes of death are not medically certified. This source of error is of comparatively small weight in the inquiry as to phthisis, as the term consumption has (perhaps more than any other) a most distinct significance to the popular mind. 3. Some causes of death are badly certified. I think phthisis is a disease where even this also is likely to be of comparatively slight importance. I do not, of course, look for scientific accuracy, but

what is generally known as consumption, both within and without the profession, is a pretty well-defined disease or group of diseases—in fact, I suppose we may consider that under it are included all those affections to which the phrase "suppurative destruction of the lungs" might be considered applicable. When we come to other forms of disease of the lungs the popular ideas are less exact, but bearing in mind that nearly 75 per cent. of all the deaths from lung disease (other than consumption) are caused by bronchitis, and pretty nearly the whole of the balance by two or three well-marked diseases—such as emphysema, asthma, and pneumonia, we see that even here the consideration of this question is not so involved as at first sight it appears—in fact, it may be almost said that the distribution of lung diseases other than consumption in Ireland means the distribution of bronchitis. Having thus cleared the ground of some of the preliminary objections, I shall proceed to deal with the question of the distribution of phthisis in Ireland. Some persons, I am aware, have an idea that consumption is not particularly prevalent in Ireland as compared with other countries. No doubt there are several, where the disease is proportionally more fatal than in our own, but, nevertheless, its prevalence here is a serious evil. Taking the average of the ten years 1871–80, the death-rate of the population of Ireland from phthisis was at the average annual rate of 19·6 per 10,000. In England and Wales the most recently calculated average taken was 17·5, in Scotland 21·3. In Scotch towns the rate was 26, in Irish town districts 34·7. It must here be remarked that in Scotland it is only the larger towns which are dealt with, whereas in Ireland it is town districts with a population of 10,000 and upwards. In these the average annual death-rates per 10,000 were as follows :—Dublin, 34·2 ; Belfast, 39·0 ; Cork, 33·8 ; Limerick, 30·6 ; Londonderry, 26·1 ; Waterford, 31·3 ; Galway, 23·3 ; Newry, 24·3 ; Kilkenny, 17·1 ; Drogheda, 22·8 ; Wexford, 28·8 ; Dundalk, 20·1 ; Sligo, 22·2 ; Lisburn, 40·0 ; Lurgan, 42·4 ; Armagh, 25·8—the average for the whole being 34·7   (See Table I.)

Table I.

Showing for the years 1881–86 the Number of Deaths from Phthisis in the Dublin Registration District and the Principal Provincial Urban Sanitary Districts.

Towns	Popula-tion*	YEARS						Average Annual Number	Average Annual Rate per 10,000 Living
		1881	1882	1883	1884	1885	1886		
Dublin	353,082	1,110	1,144	1,280	1,252	1,225	1,226	1,206	34·2
Belfast	221,822	773	799	833	844	937	996	864	39·0
Cork	80,124	237	274	271	292	287	263	271	33·8
Limerick	38,562	114	127	117	117	106	127	118	30·6
Londonderry	29,162	65	76	80	82	75	78	76	26·1
Waterford	22,457	74	78	63	67	59	77	70	31·2
Galway	15,471	28	31	38	37	41	42	36	23·3
Newry	14,808	35	40	39	37	36	29	36	24·3
Kilkenny	12,299	26	27	20	24	13	14	21	17·1
Drogheda	12,297	38	35	31	24	23	19	28	22·8
Wexford	12,163	32	31	35	47	37	27	35	28·8
Dundalk	11,913	28	21	22	24	25	23	24	20·1
Sligo	10,808	25	37	31	20	13	17	24	22·2
Lisburn	10,755	—	—	42	39	50	41	43†	40·0†
Lurgan	10,135	40	35	54	42	35	55	43	42·4
Armagh	10,070	—	—	33	25	21	25	26†	25·8†
Total	865,928	—	—	2,989	2,973	2,983	3,059	3,001†	34·7†

In the great towns of Germany (148 in number) the rate is about 35 per 10,000, in Prussia 31. In Austria (where all forms of tubercular diseases are included) it is 38, and in 15 large towns of that country it reaches the enormous rate of 72.

In the antipodal colonies of the United Kingdom the rates per 10,000 inhabitants are, according to the most recent statistics:— Victoria, 13·39; New South Wales, 10·64; Queensland, 13·84; South Australia, 10·02; Tasmania, 10·41; New Zealand, 8·61. In Melbourne the average rate was 22·31, and in the suburbs of Melbourne 8·89.

In following up the inquiry as to the distribution of phthisis

* The population given for the Dublin Registration District is the number estimated to the middle of the year 1886; that for each of the Provincial Districts (except that for Belfast, which is the number estimated to the middle of the year 1886) is the population according to the Census of 1881.

† Average for four years, 1883–86.

generally in Ireland, I have prepared a list of the Superintendent Registrars' Districts (Poor Law Unions), giving in a tabular form the death-rate per 10,000 of the mean population for the decade 1871-80 of each of these districts, of each registration division (of which there were then eight), and of Ireland, from all causes, from phthisis or pulmonary consumption, from other forms of disease of the respiratory organs, coupled with the proportion of bog and marsh and of mountain in these districts.

TABLE II.

Showing for the ten years 1871–80 the average Annual Death-rate per 10,000 of the Mean Population (1871–81) in each of the Superintendent Registrars' Districts (Poor Law Unions), in each Registration Division, and in Ireland, from all Causes, from Phthisis or Pulmonary Consumption, from other forms of Diseases of the Respiratory Organs (exclusive of Phthisis), and from all other Causes, with the proportion of Bog and Marsh and of Barren Mountain Land in each Union.

Superintendent Registrars' Districts, &c.	Average Annual Death-rate per 10,000 Persons (1871–80) from				Percentage of Land in 1881 under	
	All Causes	Phthisis	Diseases of the Respiratory Organs*	All other Causes	Bog and Marsh	Barren Mountain Land
NORTH-EASTERN DIVISION.						
Antrim - - -	183	24·4	21·0	137·6	1·8	·4
Armagh - - -	191	24·2	31·4	135·4	2·4	1·1
Ballycastle - -	159	16·4	16·2	126·4	6·6	20·7
Ballymena - -	169	25·5	19·5	124·0	7·2	7·1
Ballymoney - -	153	17·0	17·5	118·5	9·7	4·0
Banbridge - -	188	29·0	24·8	134·2	1·3	1·3
Belfast - - -	241	38·2	49·9	152·9	1·4	2·4
Castleblayney - -	170	15·9	27·3	126·8	2·6	·9
Coleraine - -	177	21·0	21·6	134·4	5·4	9·0
Cookstown - -	166	15·8	23·5	126·7	7·7	11·8
Downpatrick - -	191	26·2	24·3	140·6	1·4	2·8
Dungannon - -	175	20·0	23·9	131·1	4·8	·3
Kilkeel - - -	173	20·9	17·6	134·5	·2	36·6
Larne - - -	170	27·6	19·4	123·0	4·1	8·1
Limavady - -	173	17·1	18·9	137·0	6·0	16·4
Lisburn - - -	202	30·8	29·2	142·0	·4	·3

* Exclusive of Phthisis.

Table II.—*continued.*

Superintendent Registrars' Districts, &c.	Average Annual Death-rate per 10,000 Persons (1871–80) from				Percentage of Land in 1881 under	
	All Causes	Phthisis	Diseases of the Respiratory Organs*	All other Causes	Bog and Marsh	Barren Mountain Land
Lurgan - -	191	28·5	29·9	132·6	4·7	·1
Magherafelt - -	170	17·7	22·1	130·2	7·2	11·3
Newry - -	186	25·0	29·0	132·0	·9	10·4
Newtownards - -	208	31·7	25·8	150·5	1·4	1·2
NORTH-WESTERN DIVISION.						
Ballyshannon - -	149	20·7	12·7	115·6	8·8	14·7
Castlederg - -	142	15·5	17·0	109·5	9·6	22·7
Donegal - -	150	17·3	17·0	115·7	8·1	37·8
Dunfanaghy - -	145	10·2	19·9	114·9	24·7	41·9
Enniskillen - -	163	17·4	22·4	123·2	4·3	9·2
Glenties - -	131	11·7	13·2	106·1	19·9	29·7
Gortin - -	139	16·6	13·7	108·7	9·9	44·3
Inishowen - -	175	15·6	21·1	138·3	12·9	36·5
Irvinestown - -	143	14·0	18·7	110·3	4·2	2·7
Letterkenny - -	171	20·3	18·1	132·6	9·0	18·0
Londonderry - -	186	24·0	20·1	141·9	4·3	14·9
Manorhamilton -	145	20·2	16·2	108·6	10·9	11·8
Millford - -	151	10·8	18·5	121·7	6·6	29·5
Omagh - - -	164	18·1	21·2	124·7	10·5	6·5
Sligo - - -	152	19·0	21·2	111·8	5·2	9·2
Strabane - -	166	19·6	20·6	125·8	3·2	5·8
Stranorlar - -	153	14·7	18·2	120·1	20·7	24·9
EASTERN DIVISION.						
Ardee - -	195	19·4	27·4	148·2	1·6	—
Bailieborough - -	163	11·2	30·0	121·8	4·3	·5
Balrothery - -	206	26·1	24·7	155·2	·5	·6
Baltinglass - -	170	18·5	23·9	127·6	4·5	11·6
Carrickmacross -	157	10·2	18·9	127·9	1·4	·6
Celbridge - -	189	25·5	30·9	132·6	·5	·6
Drogheda - -	194	24·7	25·3	144·0	·3	·1
Dublin, North -	279	33·4	52·9	192·7	·1	2·2
Dublin, South - -	274	30·0	53·3	190·7	3·2	14·2
Dundalk - -	191	15·9	31·6	143·5	1·5	12·2
Dunshaughlin - -	183	22·5	28·2	132·3	·1	—
Gorey - - -	189	24·0	24·4	140·6	2·1	3·5
Kells - - -	163	13·6	24·5	124·9	2·9	·1
Naas - - -	168	22·7	24·2	121·1	9·4	8·5
Navan - - -	182	32·7	23·4	125·9	·7	·1
Rathdown - -	194	23·8	32·3	137·9	1·0	25·6
Rathdrum - -	174	26·0	20·7	127·3	5·3	20·1
Shillelagh - -	167	19·9	22·9	124·2	6·9	7·2
Trim - - -	189	26·3	22·6	140·1	3·7	—

* Exclusive of Phthisis.

TABLE II.—*continued.*

Superintendent Registrars' Districts, &c.	Average Annual Death-rate per 10,000 Persons (1871–80) from				Percentage of Land in 1881 under	
	All Causes	Phthisis	Diseases of the Respiratory Organs*	All other Causes	Bog and Marsh	Barren Mountain Land
NORTH MIDLAND DIVISION.						
Athlone - -	156	15·2	17·4	123·4	14·4	·8
Ballymahon - -	166	13·3	23·9	128·8	14·0	·3
Bawnboy - -	152	14·2	25·6	112·2	7·0	12·1
Carrick-on-Shannon -	147	13·6	25·0	108·4	4·5	6·5
Cavan - - -	165	14·0	21·1	129·9	3·1	·6
Clogher - -	171	18·2	21·0	131·8	8·8	9·2
Clones - - -	143	16·8	28·0	98·2	3·6	1·2
Cootehill - -	157	14·5	29·7	112·8	1·6	·5
Delvin - - -	174	20·7	22·1	131·2	8·0	·6
Granard - -	154	11·4	19·7	122·9	13·0	·1
Lisnaskea - -	157	16·5	23·1	117·4	4·7	4·5
Longford - -	155	16·5	12·4	126·1	17·1	·3
Mohill - - -	140	11·2	24·9	103·9	9·3	—
Monaghan - -	177	19·2	26·7	131·1	2·6	2·9
Mullingar - -	201	23·5	19·0	158·5	8·4	·1
Oldcastle - -	163	11·8	15·3	135·9	3·7	·2
Roscommon - -	192	12·1	31·8	148·1	10·9	·3
Strokestown - -	147	14·0	11·3	121·7	13·0	·4
SOUTH MIDLAND DIVISION.						
Abbeyleix - -	202	24·0	18·4	159·6	6·9	·8
Athy - - -	181	20·7	25·6	134·7	4·8	·3
Borrisokane - -	135	12·5	17·6	104·9	8·6	·3
Carlow - - -	200	22·4	25·1	152·5	2·1	2·1
Cashel - - -	195	15·7	40·0	139·3	2·7	1·6
Castlecomer - -	203	18·3	36·0	148·7	1·0	·4
Donaghmore - -	135	11·4	17·9	105·7	7·9	—
Edenderry - -	192	23·8	25·2	143·0	25·7	—
Kilkenny - -	205	19·1	31·6	154·3	·6	·3
Mountmellick - -	179	17·7	22·5	138·8	11·0	8·4
Nenagh - -	162	11·8	27·5	122·7	4·3	8·4
Parsonstown - -	160	19·1	18·0	122·9	24·6	1·4
Roscrea - -	160	15·1	17·4	127·5	7·2	2·5
Thurles - -	177	14·3	27·0	135·7	8·8	1·4
Tipperary - -	179	18·9	24·8	135·3	1·6	5·1
Tullamore - -	179	20·3	21·5	137·2	15·7	·1
Urlingford - -	190	13·6	26·8	149·6	7·6	·2
WESTERN DIVISION.						
Ballina - - -	130	9·2	17·4	103·4	26·1	13·5
Ballinasloe - -	160	18·9	16·8	124·3	19·7	·5
Ballinrobe - -	144	8·3	20·3	115·4	9·7	11·9
Ballyvaughan - -	166	9·3	21·4	135·3	3·0	22·7

* Exclusive of Phthisis.

Table II.—continued.

Superintendent Registrars' Districts, &c.	Average Annual Death-rate per 10,000 Persons (1871–80) from				Percentage of Land in 1881 under	
	All Causes	Phthisis	Diseases of the Respiratory Organs*	All other Causes	Bog and Marsh	Barren Mountain Land
Belmullet - -	101	4·8	8·7	87·5	43·5	23·8
Boyle - - -	124	12·3	12·3	99·4	9·2	3·6
Castlebar - -	126	12·2	16·0	97·8	17·3	14·8
Castlereagh - -	127	10·9	14·6	101 5	20·9	·4
Claremorris - -	148	8·5	19·0	120·5	14·0	—
Clifden - -	121	10·5	13·5	97·0	25·3	32·8
Corrofin - -	150	10·6	21·6	117·8	2·2	16·0
Dromore, West -	126	9·7	12·3	104·0	14·6	19·9
Ennis - - -	179	14·1	24·7	140·2	2·0	4·6
Ennistimon - -	143	9·1	22·4	111·5	6·2	3·6
Galway - -	187	16·8	19·3	150·9	12·2	18·3
Glennamaddy - -	145	10·6	22·3	112·1	23·2	·1
Gort - - -	149	12·6	19·6	116·8	1·8	11·8
Killadysart - -	150	9·1	21·4	119·5	5·2	4·8
Killala - -	148	10·0	16·8	121·2	31·0	24·5
Kilrush - -	161	11·6	18·6	130·8	7·1	3·5
Loughrea - -	151	7·8	16·4	126·8	14·2	9·1
Mountbellew - -	156	9·4	25·6	121·0	22·0	·6
Newport - -	117	6·4	15·1	95·5	27·8	38·4
Oughterard - -	119	10·0	11·8	97·2	17·1	30·1
Portumna - -	156	13·2	22·9	119·9	13·1	5·5
Scarriff - -	141	9·1	27·3	104·6	4·4	25·1
Swinford - -	151	13·5	15·4	122·1	16·5	3·1
Tobercurry - -	131	14·5	13·4	103·1	12·4	22·9
Tuam - - -	146	7·6	15·3	123·1	11·5	1·4
Tulla - - -	137	12·9	15·2	108·9	8·3	10·8
Westport - -	157	11·9	17·7	127·4	16·0	16·6
South-Eastern Division.						
Callan - - -	207	15·4	26·9	164·7	·6	·4
Carrick-on-Suir -	215	23·4	32·0	159·6	2·3	9·0
Clogheen - -	193	13·1	30·9	149·0	·6	29·4
Clonmel - -	231	20·3	48·1	162·6	2·1	16·2
Dungarvan - -	222	15·0	37·5	169·5	4·3	20·5
Enniscorthy - -	190	20·6	27·8	141·6	2·4	5·6
Fermoy - -	184	14·6	29·7	139·7	2·6	10·2
Kilmacthomas - -	206	15·1	46·3	144·6	9·4	10·4
Lismore - -	192	14·4	20·4	157·2	24·8	2·5
Middleton - -	164	15·2	32·5	116·3	2·5	3·4
Mitchelstown - -	186	12·8	41·3	131·9	·9	12·4
New Ross - -	196	20·3	21·6	154·1	2·9	4·8
Thomastown - -	211	15·7	42·2	153·1	1·5	6·5
Waterford - -	234	27·7	31·2	175·1	4·4	2·6
Wexford - -	210	25·9	29·1	155·0	2·5	1·5
Youghal - -	172	14·9	22·9	134·2	1·9	7·9

* Exclusive of Phthisis.

X

TABLE II.—*continued.*

Superintendent Registrars' Districts, &c.	Average Annual Death-rate per 10,000 Persons (1871–80) from				Percentage of Land in 1881 under	
	All Causes	Phthisis	Diseases of the Respiratory Organs*	All other Causes	Bog and Marsh	Barren Mountain Land
SOUTH-WESTERN DIVISION.						
Bandon - - -	178	17·2	28·6	132·2	7·2	2·3
Bantry . -	149	11·8	23·8	113·4	4·7	39·3
Caherciveen - -	152	9·5	13·2	129·3	14·4	28·8
Castletown - -	162	12·5	26·1	123·4	6·3	42·5
Clonakilty - -	158	12·0	24·8	121·2	4·9	3·8
Cork - - -	235	27·4	38·7	168·9	5·2	4·2
Croom - - -	170	12·8	31·3	125·9	·7	1·1
Dingle - - -	177	13·3	26·4	137·3	6·7	24·7
Dunmanway - -	146	9·5	22·9	113·6	10·2	19·5
Glin - - -	164	13·9	29·9	120·2	8·2	2·3
Kanturk - -	166	10·6	35·5	119·9	4·5	6·7
Kenmare - -	146	9·2	16·9	119·9	8·2	31·0
Killarney - -	172	17·0	23·4	131·6	9·0	25·3
Kilmallock . -	209	14·2	50·3	144·5	·9	5·8
Kinsale - -	182	18·0	26·8	137·2	2·4	2·8
Limerick - -	209	20·7	33·5	154·8	2·8	4·3
Listowel - -	160	14·0	16·0	130·0	9·3	4·1
Macroom - -	153	8·9	19·6	124·5	8·7	16·9
Mallow - - -	189	14·8	34·0	140·2	3·5	9·1
Millstreet - -	163	12·9	28·2	121·9	7·6	12·6
Newcastle - -	163	11·6	25·0	126·4	3·8	3·3
Rathkeale - -	185	15·2	31·2	138·6	1·8	·8
Skibbereen - -	150	10·7	24·5	114·8	4·7	13·4
Skull - - -	155	11·8	21·3	121·9	3·4	27·1
Tralee - - -	174	12·6	19·8	141·6	8·4	18·7
DIVISIONS.						
NORTH-EASTERN	193	26·8	29·6	136·6	—	—
NORTH-WESTERN	158	17·6	18·7	121·7	—	—
EASTERN - -	223	25·8	38·0	159·2	—	—
NORTH MIDLAND -	163	15·4	22·0	125·6	—	—
SOUTH MIDLAND -	181	18·2	25·3	137·5	—	—
WESTERN - -	144	11·2	17·3	115·5	—	—
SOUTH-EASTERN .	202	19·2	31·4	151·4	—	—
SOUTH-WESTERN -	184	16·3	29·0	138·7	—	—
IRELAND - -	183	19·6	27·0	136·4	8·4	10·4

This table furnishes the principal data for the inquiry upon which the following remarks are based. In order to facilitate comparison I have constructed a graphic diagram where the curves represent the variation in the four principal series of

* Exclusive of Phthisis.

DIAGRAM I

statistics contained in Table II.—namely, the death-rates from phthisis and from other forms of diseases of the respiratory organs, inclusive of phthisis, and the extent of bog and marsh and of barren mountain land in each of the districts given in the table. The physical conditions of the country are shown in the upper, the death-rates in the lower, division of the diagram. This diagram shows at a glance the remarkable fact that the curves representing the distribution of phthisis and of other forms of disease of the respiratory organs do not run parallel to one another.

Table III.—Phthisis.

Showing Average Annual Rate (1871–80) per 10,000 of the Mean Population, represented by Deaths from Phthisis, in each of the Superintendent Registrars' Districts (Poor Law Unions), arranged from lowest to highest.

No.	Superintendent Registrars' Districts (Poor Law Unions)	Percentage of Total Deaths	Rate	No.	Superintendent Registrars' Districts (Poor Law Unions)	Percentage of Total Deaths	Rate
1	Belmullet -	4·7	4·8	32	Donaghmore -	8·4	11·4
2	Newport -	5·5	6·4	33	Kilrush -	7·2	11·6
3	Tuam -	5·2	7·6	34	Newcastle -	7·1	11·6
4	Loughrea -	5·2	7·8	35	Glenties -	8·9	11·7
5	Ballinrobe -	5·8	8·3	36	Oldcastle -	7·2	11·8
6	Claremorris -	5·7	8·5	37	Nenagh -	7·3	11·8
7	Macroom -	5·8	8·9	38	Bantry -	7·9	11·8
8	Ennistimon -	6·4	9·1	39	Skull -	7·6	11·8
9	Killadysart -	6·1	9·1	40	Westport -	7·6	11·9
10	Scarriff -	6·5	9·1	41	Clonakilty -	7·6	12·0
11	Ballina -	7·1	9·2	42	Roscommon -	6·3	12·1
12	Kenmare -	6·3	9·2	43	Castlebar -	9·7	12·2
13	Ballyvaughan -	5·6	9·3	44	Boyle -	9·9	12·3
14	Mountbellew -	6·0	9·4	45	Borrisokane -	9·3	12·5
15	Cahirciveen -	6·2	9·5	46	Castletown -	7·7	12·5
16	Dunmanway -	6·5	9·5	47	Gort -	8·5	12·6
17	Dromore, West -	7·7	9·7	48	Tralee -	7·2	12·6
18	Killala -	6·8	10·0	49	Croom -	7·5	12·8
19	Oughterard -	8·4	10·0	50	Mitchelstown -	6·9	12·8
20	Carrickmacross -	6·5	10·2	51	Tulla -	9·4	12·9
21	Dunfanaghy -	7·0	10·2	52	Millstreet -	7·9	12·9
22	Clifden -	8·7	10·5	53	Clogheen -	6·8	13·1
23	Corrofin -	7·1	10·6	54	Portumna -	8·5	13·2
24	Glennamaddy -	7·3	10·6	55	Ballymahon -	8·0	13·3
25	Kanturk -	6·4	10·6	56	Dingle -	7·5	13·3
26	Skibbereen -	7·1	10·7	57	Swineford -	8·9	13·5
27	Millford -	7·2	10·8	58	Carrick-on-Shan.	9·3	13·6
28	Castlereagh -	8·6	10·9	59	Urlingford -	7·2	13·6
29	Bailieborough -	6·9	11·2	60	Kells -	8·3	13·6
30	Mohill -	8·0	11·2	61	Glin -	8·5	13·9
31	Granard -	7·4	11·4	62	Irvinestown -	9·8	14·0

TABLE III.—*continued.*

No.	Superintendent Registrars' Districts (Poor Law Unions)	Percentage of Total Deaths	Rate	No.	Superintendent Registrars' Districts (Poor Law Unions)	Percentage of Total Deaths	Rate
63	Strokestown -	9·5	14·0	115	Monaghan -	10·8	19·2
64	Listowel -	8·8	14·0	116	Ardee -	9·9	19·4
65	Cavan -	8·5	14·0	117	Strabane -	11·8	19·6
66	Ennis -	7·9	14·1	118	Shillelagh -	11·9	19·9
67	Bawnboy -	9·3	14·2	119	Dungannon -	11·4	20·0
68	Kilmallock -	6·8	14·2	120	Manorhamilton -	13·9	20·2
69	Thurles -	8·1	14·3	121	Letterkenny -	11·9	20·3
70	Lismore -	7·5	14·4	122	Tullamore -	11·3	20·3
71	Cootehill -	9·2	14·5	123	Clonmel -	8·8	20·3
72	Tobercurry -	11·1	14·5	124	New Ross -	10·4	20·3
73	Fermoy -	7·9	14·6	125	Enniscorthy -	10·8	20·6
74	Stranorlar -	9·6	14·7	126	Delvin -	11·9	20·7
75	Mallow -	7·8	14·8	127	Athy -	11·4	20·7
76	Youghal -	8·7	14·9	128	Limerick -	9·9	20·7
77	Dungarvan -	6·8	15·0	129	Ballyshannon -	13·9	20·7
78	Roscrea -	9·4	15·1	130	Kilkeel -	12·1	20·9
79	Kilmacthomas -	7·3	15·1	131	Coleraine -	11·9	21·0
80	Athlone -	9·7	15·2	132	Carlow -	11·2	22·4
81	Middleton -	9·3	15·2	133	Dunshaughlin -	12·3	22·5
82	Rathkeale -	8·2	15·2	134	Naas -	13·5	22·7
83	Callan -	7·4	15·4	135	Carrick-on-Suir -	10·9	23·4
84	Castlederg -	10·9	15·5	136	Mullingar -	11·7	23·5
85	Inishowen -	8·9	15·6	137	Rathdown -	12·3	23·8
86	Thomastown -	7·4	15·7	138	Edenderry -	12·4	23·8
87	Cashel -	8·1	15·7	139	Gorey -	12·7	24·0
88	Cookstown -	9·5	15·8	140	Abbeyleix -	11·9	24·0
89	Castleblayney -	9·4	15·9	141	Londonderry -	12·9	24·0
90	Dundalk -	8·3	15·9	142	Armagh -	12·7	24·2
91	Ballycastle -	10·3	16·4	143	Antrim -	13·3	24·4
92	Lisnaskea -	10·5	16·5	144	Drogheda -	12·7	24·7
93	Longford -	10·6	16·5	145	Newry -	13·4	25·0
94	Gortin -	11·9	16·6	146	Ballymena -	15·1	25·5
95	Clones -	11·7	16·8	147	Celbridge -	13·5	25·5
96	Galway -	9·0	16·8	148	Wexford -	12·3	25·9
97	Ballymoney -	11·1	17·0	149	Rathdrum -	14·9	26·0
98	Killarney -	9·9	17·0	150	Balrothery -	12·7	26·1
99	Limavady -	9·9	17·1	151	Downpatrick -	13·7	26·2
100	Bandon -	9·7	17·2	152	Trim -	13·9	26·3
101	Donegal -	11·5	17·3	153	Cork -	11·7	27·4
102	Enniskillen -	10·7	17·4	154	Larne -	16·2	27·6
103	Magherafelt -	10·4	17·7	155	Waterford -	11·8	27·7
104	Mountmellick -	9·9	17·7	156	Lurgan -	14·9	28·5
105	Kinsale -	9·9	18·0	157	Banbridge -	15·4	29·0
106	Omagh -	11·0	18·1	158	Dublin, South -	10·9	30·0
107	Clogher -	10·6	18·2	159	Lisburn -	15·2	30·8
108	Castlecomer -	9·0	18·3	160	Newtownards -	15·2	31·7
109	Baltinglass -	10·9	18·5	161	Navan -	18·0	32·7
110	Tipperary -	10·6	18·9	162	Dublin, North -	12·0	33·4
111	Ballinasloe -	11·8	18·9	163	Belfast -	15·9	38·2
112	Sligo -	12·5	19·0				
113	Parsonstown -	11·9	19·1		Ireland, -	10·7	19·6
114	Kilkenny -	9·3	19·1				

MAP OF IRELAND.

Average Annual Rate, 1871–80,
per 10,000 of Mean Population,
represented by Deaths from

PHTHISIS

in each Poor Law Union.

ISOTHERMALS shewing the
MEAN TEMPERATURE

Annual	————
January	—·—·—
July	·········
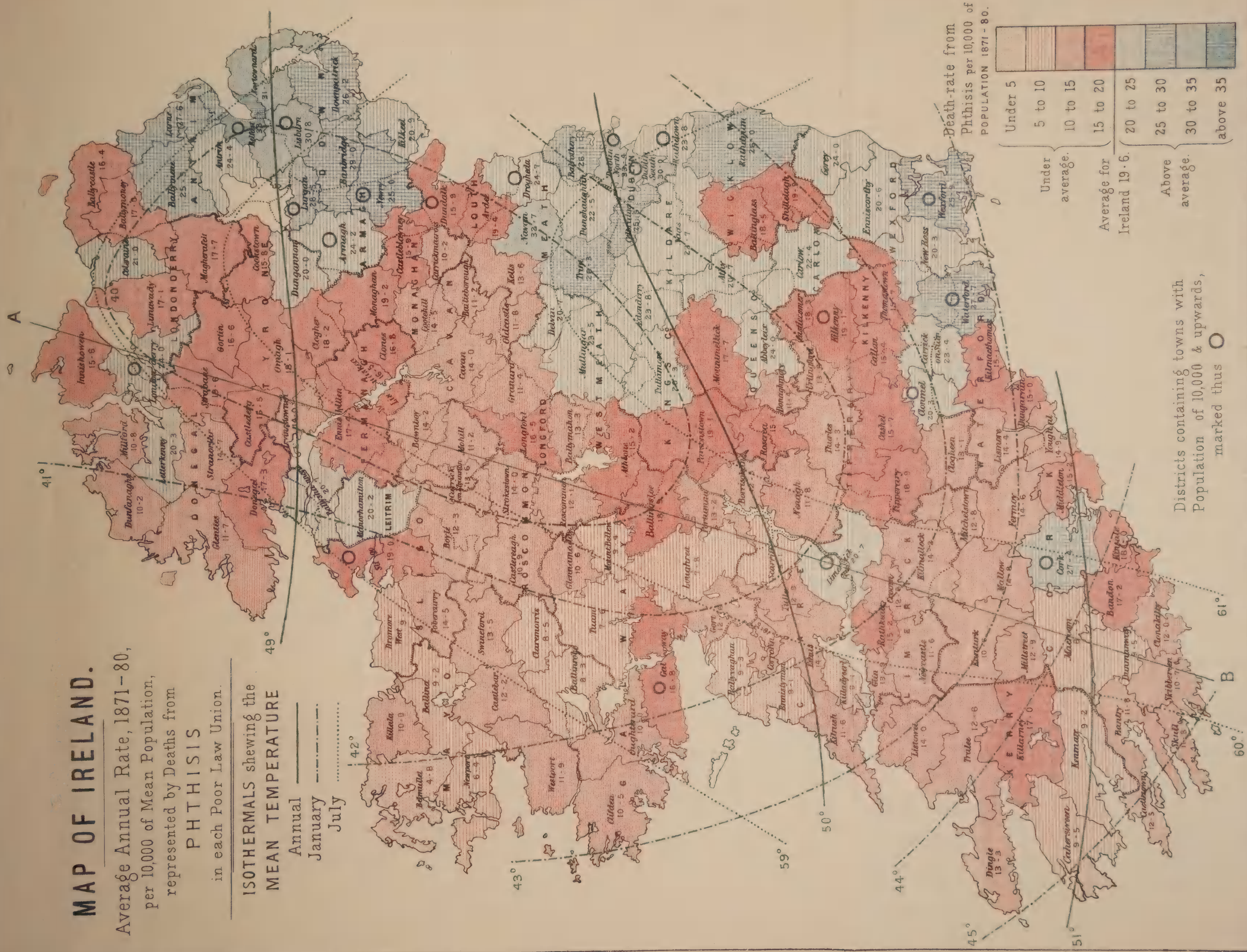
Death-rate from
Phthisis per 10,000 of
POPULATION 1871–80.

Under average.	Under 5
	5 to 10
	10 to 15
Average for Ireland 19·6.	15 to 20
	20 to 25
Above average.	25 to 30
	30 to 35
	above 35

Districts containing towns with
Population of 10,000 & upwards,
marked thus ⃝

F Huth, Lith.r Edin.r

With the view of following up this question in greater detail, I have prepared Table III., which shows the average annual death-rate for the decade 1871-80 per 10,000 of the mean population from phthisis in each of the Superintendent Registrars' Districts, ranging from the lowest in Belmullet to the highest in Belfast. The average death-rate from phthisis in Ireland during the decade 1871–80 was 19·6 per 10,000 of the mean population. On looking at the tabular list it will be seen that the district of Strabane, on the border of the counties of Tyrone and Donegal, has exactly the average death-rate. It will be found that there are 46 unions with higher death-rates from phthisis than Strabane, those rates ranging from 19·9 in Shillelagh to 38·2 in Belfast, which is the highest rate in Ireland, Dublin North being the next worst with a rate of 33·4. It will also be found that there are 116 unions with a lower death-rate from phthisis than Strabane, ranging from 19·0 in Ardee to the very small rate of 4·8 in Belmullet. Of the 103,528 deaths from phthisis 62,192 occurred in the unions where the rate was up to or above average, and 41,336 where it was below average.

A series of maps have been constructed with the view of showing the distribution in Ireland of the diseases under consideration, as shown by the death-rates, and the relation to this distribution of certain physical and meteorological conditions. There are three of these maps, and, turning our attention to that showing the death-rate from phthisis, we find that two colours are employed to denote whether the death-rate was above or below average. All those districts where the death rate from phthisis is above average are shaded in blue, and all those where it is below average in red; the varying tints of the shading showing the degrees above or below average according to a scale marked in the map. A glance shows that the blue shading is most extensive over the eastern side, and the red most extensive over the western side—in fact, the blue is rare towards the west, and common towards the east; even the red where present in the east is of a darker tinge than in the west. I have found, from other statistical investigations, that if a line, marked A B in the map, be drawn through Ireland from Londonderry to Skibbereen, the country will be divided into two peculiar districts. The portion situated west of this line comprises the eight western counties of Ireland, namely—the five Connaught counties,

with Donegal, Clare, and Kerry, including a population almost altogether rural and, in many places, very backward in civilisation, as compared with the other portions of the country. This western side represents what may be called the poverty-stricken portion, where the people are almost constantly on the verge of pauperism, and where the least failure of crops brings them to the brink of famine. This line, which I drew in 1879 as indicating the boundary of the distressed districts during that disastrous year, has since been recognised by nearly all students of Irish social problems as the boundary of two social provinces in Ireland. If we look at the question of the geographical distribution of phthisis between these two social provinces, we find that the boundary line cuts through three unions with phthisical death-rates at or but little above average—namely, Londonderry, Strabane, and Limerick, and that it leaves only three whole unions with death-rates above the average to its western side—namely, Letterkenny, Ballyshannon, and Manorhamilton, and these are but slightly above the average. On the eastern side of the line, on the other hand, we find the majority of the districts with high death-rates. It would, therefore, appear that the higher civilisation favours the prevalence of phthisis. No doubt this is to some extent true, for phthisis prevails, as already pointed out, to a greater extent in town than in country districts, and large towns are incident to advanced civilisation. We thus find that two of the unions—namely, Londonderry and Limerick, containing towns with 10,000 inhabitants and upwards, are on the line, and with the exception of Galway and Sligo all the others containing large town districts—namely, Belfast, Lisburn, Lurgan, Armagh, Newry, Dundalk, Drogheda, North and South Dublin, Rathdown, Kilkenny, Wexford, Waterford, Clonmel, and Cork, are to the east of the line. It will, however, be observed from the map, that the mere presence of large towns will not sufficiently account for the high phthisical death-rate, as the blue shading and the darker reds spread far beyond the large towns. Even admitting that the infectious nature of phthisis would favour its spread from each large town as a centre, it seems scarcely sufficient to explain the prevalence of this disease in such counties as Meath, Westmeath, King's, Kildare, Wicklow, and Wexford, where the occupations of the people are as rural as they are in Connaught, and their house accommodation not inferior.

Table IV.

Showing by Counties the Percentage of Families occupying (in 1881) 3rd or 4th Class House Accommodation, and the Death-rate in 1885, from "All Causes," "Phthisis," and "Diseases of the Respiratory Organs (exclusive of Phthisis)."

Counties, &c.	Percentage of Families occupying 3rd or 4th Class House Accommodation in 1881			1885 Death-rate per 10,000 from			
	3rd Class	4th Class	Total	All Causes	Phthisis	Diseases of the Respiratory Organs*	All other Causes
LEINSTER.							
Carlow -	37·6	6·2	43·8	167	20·0	25·3	121·7
Dublin -	34·5	6·8	41·3	274	34·0	54·8	185·2
Kildare -	48·5	8·9	57·4	164	23·6	28·8	111·6
Kilkenny -	36·9	6·4	43·3	172	15·3	30·2	126·5
King's -	44·9	7·3	52·2	150	17·8	18·9	113·3
Longford -	44·6	7·1	51·7	137	16·9	17·9	102·2
Louth -	52·7	6·1	58·8	186	23·4	35·1	127·5
Meath -	52·2	9·8	62·0	178	19·2	32·8	126·0
Queen's -	46·1	5·7	51·8	151	16·0	23·9	111·1
Westmeath -	43·7	6·6	50·3	182	23·1	24·1	134·8
Wexford -	40·4	6·8	47·2	172	22·8	32·5	116·7
Wicklow -	34·4	5·8	40·2	165	25·4	26·6	113·0
MUNSTER.							
Clare -	46·4	7·1	53·5	149	15·0	24·7	109·3
Cork -	44·2	8·9	53·1	189	19·8	39·7	129·5
Kerry -	53·7	17·1	70·8	147	15·1	22·8	109·1
Limerick -	45·4	15·0	60·4	192	18·6	43·4	130·0
Tipperary -	40·8	8·3	49·1	173	15·4	33·1	124·5
Waterford -	42·5	6·8	49·3	193	20·4	26·8	145·8
ULSTER.							
Antrim -	46·6	2·3	48·9	224	31·1	43·7	149·2
Armagh -	47·0	4·1	51·1	181	24·9	32·2	12·39
Cavan -	47·4	6·3	53·7	129	15·2	17·8	96·0
Donegal -	61·6	4·8	66·4	134	14·9	19·6	99·6
Down -	38·9	1·8	40·7	187	28·1	30·0	128·9
Fermanagh -	43·9	3·9	47·8	139	13·8	20·1	105·1
Londonderry -	48·8	2·8	51·6	169	19·4	26·4	123·2
Monaghan -	48·5	3·4	51·9	170	18·8	34·5	116·7
Tyrone -	51·3	3·1	54·4	153	20·8	21·0	111·2
CONNAUGHT.							
Galway -	56·8	9·0	65·8	131	12·6	18·9	99·5
Leitrim -	49·6	5·0	54·6	131	17·5	17·9	95·6
Mayo -	73·4	8·1	81·5	123	12·6	19·2	91·2
Roscommon -	57·0	5·5	62·5	137	12·4	24·2	100·4
Sligo -	58·3	6·8	65·1	131	17·9	17·2	95·9
IRELAND -	48·9	6·7	55·6	184	21·7	32·5	129·8

* Exclusive of Phthisis.

I have referred to the nature of the house accommodation, and I regret that the Census Returns do not afford the means of comparing the house accommodation with the distribution of phthisis in unions, but I have here a table (Table IV.) which makes the comparison by counties for the year 1881, previous to which date such comparison was impossible. From this comparison it is apparent that inferior house accommodation and slight prevalence of phthisis are nearly parallel. The inference might be that inferior house accommodation is unfavourable to the prevalence of phthisis. I need scarcely say that this is not the case, the truth being that rural life and low phthisis death-rate coincide, and so also, unfortunately, do rural life and bad house accommodation in Ireland.

If we compare the distribution of phthisis with the physical configuration of the country we shall find some remarkable coincidences. We have two sources from which information on this subject can be drawn—firstly, from the Agricultural Statistical Reports issued by the General Register Office under my direction ; secondly, from the elevation shadings of the maps in the Meteorological Atlas, published by the Meteorological Office under the direction of Mr. R. H. Scott, F.R.S., Secretary to the Meteorological Committee. These shadings have been transferred to a map, which also includes information regarding mean atmospheric pressure and rainfall.

From the Agricultural Statistics of Ireland issued by the General Register Office, I am able to derive some useful information applicable to this question. In these statistics there are, among other items, records of bog and marsh, barren mountain, &c., which are necessary to distinguish those portions of land which are either not utilised for agricultural purposes or are unfit for cultivation.

Under this classification of land there are two principal heads, "bog and marsh," indicating land agriculturally useless from its wetness, and "barren mountain," useless from its stony and elevated character. It is evident that the latter will almost always represent districts of considerable elevation. It cannot, however, be said of Ireland, as might be of many countries, that "bog and marsh" necessarily represent low-lying districts. On the contrary,

MAP OF IRELAND.

ISOBARS shewing in inches the
MEAN ATMOSPHERIC PRESSURE

Annual ——————
January — · — · —
July ·············

29·92

MEAN ANNUAL RAINFALL

Under 30 inches
30 to 40 do.
40 to 60 do.
60 to 80 do.
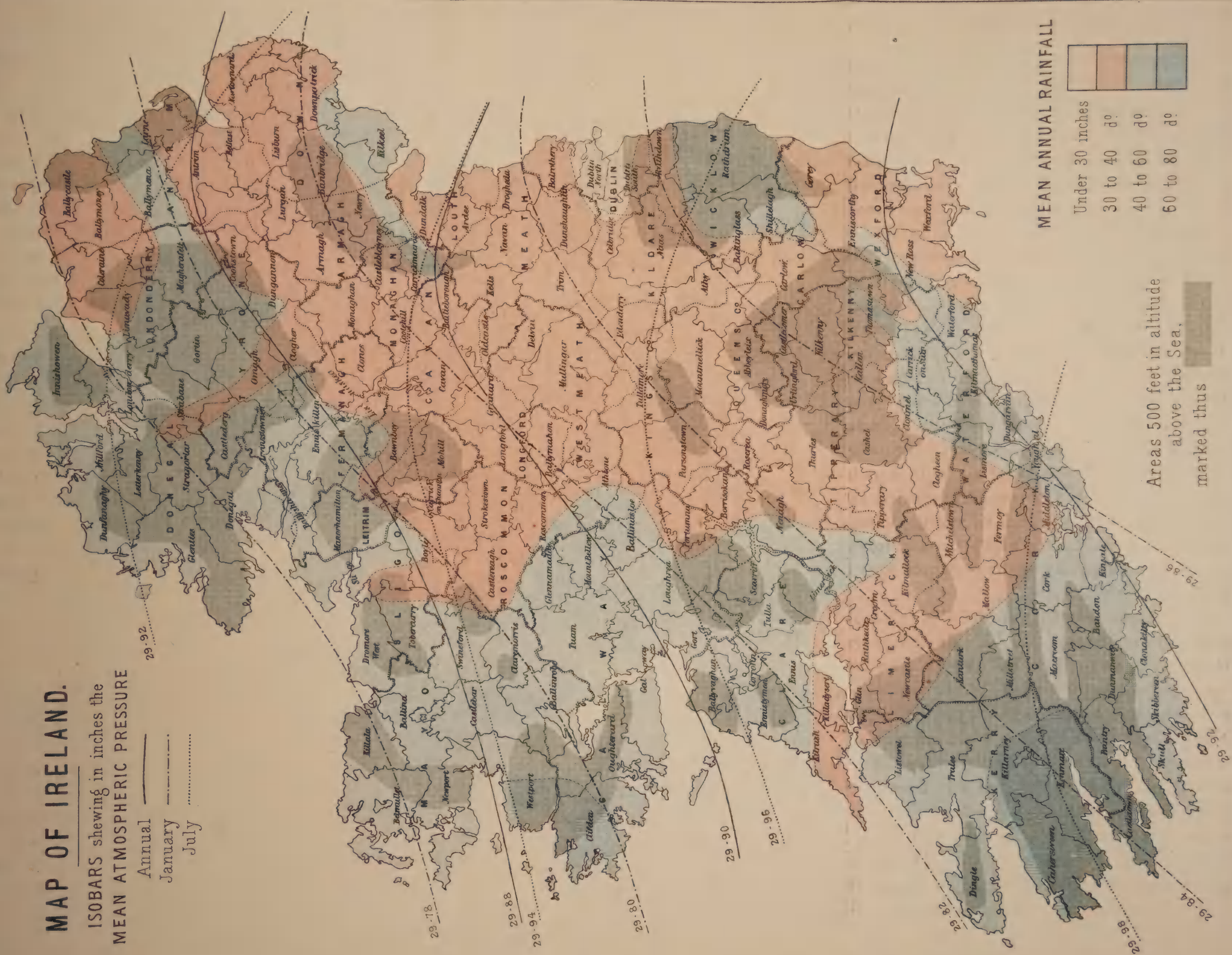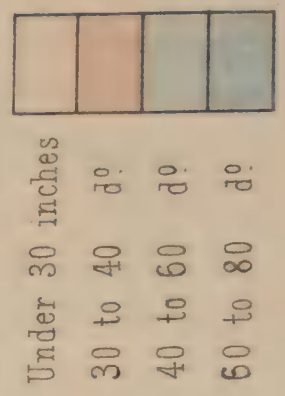
Areas 500 feet in altitude
above the Sea.
marked thus

F. Huth, Lith.r Edin.r

29·78
29·88
29·94
29·90
29·96
29·80
29·82
29·84
29·92
29·98
29·62

many Irish bogs are of high elevation, and practically (as distinguished from bogs) there is little or no marsh in Ireland. Fortunately these physical conditions in Ireland are tabulated by unions for the purpose of agricultural statistics, and the areas are therefore coincident with the districts of the Superintendent Registrars of Deaths.

In Table III., where the unions are arranged according to the prevalence of phthisis from the highest to the lowest death-rate, I have shown that the average death-rate being 19·6, there are 116 unions with a death-rate below, and 46 with a death-rate above, the average. Turning to Table V., where the unions are arranged according to the proportion of barren mountain contained therein, we find that the average of barren mountain in Ireland is 10·4 per cent. Of these there are two unions at the average—namely, Kilmacthomas and Newry. There are 56 unions with an area of barren mountain above average and 105 below average. Among the 50 with an area of barren mountain above average (excluding town districts, of which there are six—namely, Dundalk, Dublin, South, Londonderry, Clonmel, Galway and Rathdown), there are found but five, or 10 per cent., with phthisis death-rates above the average. On the other hand, among the 105 with the mountain area below average (exclusive of town districts, of which there are 12), there are 66 districts, or 71 per cent., in which the death-rate from phthisis is below the average. Now, taking the proportion of boggy and marshy districts—Table VI.—in a similar manner, it is found that the average area of "bog and marsh" is 8·4 per cent. There are two districts—Mullingar and Tralee— where the area of bog and marsh is at the average, 106 where it is below average, and 57 where it is above average. Among the 55 boggy and marshy unions we find, exclusive of town districts (of which there is only one), there are only 7, or about 13 per cent., where the death-rate from phthisis is above the average. Excluding town districts, which number 18, there are 88 where the bog and marsh is below average, and of these there are 24, or 27 per cent., in which the phthisis death-rate is above the average. If we take the districts where mountain and bog are both above

average, we find there are in all 25 unions; of these, in three, or 12 per cent., the phthisis death-rate is above average—namely, in Ballyshannon, Letterkenny, and Manorhamilton.

TABLE V.—DIVISION OF LAND, IRELAND, 1881.

Showing proportion per cent. under Barren Mountain Land in each Poor Law Union, arranged from lowest to highest.

No.	Superintendent Registrars' Districts (Poor Law Unions)		Rate	No.	Superintendent Registrars' Districts (Poor Law Unions)		Rate
1	Ardee	-	—	40	Abbeyleix	-	·8
2	Claremorris	-	—	41	Athlone	-	·8
3	Donaghmore	-	—	42	Rathkeale	-	·8
4	Dunshaughlin	-	—	43	Castleblayney	-	·9
5	Edenderry	-	—	44	Armagh	-	1·1
6	Mohill	-	—	45	Croom	-	1·1
7	Trim	-	—	46	Clones	-	1·2
8	Drogheda	-	·1	47	Newtownards	-	1·2
9	Glennamaddy	-	·1	48	Banbridge	-	1·3
10	Granard	-	·1	49	Parsonstown	-	1·4
11	Kells	-	·1	50	Thurles	-	1·4
12	Lurgan	-	·1	51	Tuam	-	1·4
13	Mullingar	-	·1	52	Wexford	-	1·5
14	Navan	-	·1	53	Cashel	-	1·6
15	Tullamore	-	·1	54	Carlow	-	2·1
16	Oldcastle	-	·2	55	Dublin, North	-	2·2
17	Urlingford	-	·2	56	Bandon	-	2·3
18	Athy	-	·3	57	Glin	-	2·3
19	Ballymahon	-	·3	58	Belfast	-	2·4
20	Borrisokane	-	·3	59	Lismore	-	2·5
21	Dungannon	-	·3	60	Roscrea	-	2·5
22	Kilkenny	-	·3	61	Waterford	-	2·6
23	Lisburn	-	·3	62	Irvinestown	-	2·7
24	Longford	-	·3	63	Downpatrick	-	2·8
25	Roscommon	-	·3	64	Kinsale	-	2·8
26	Antrim	-	·4	65	Monaghan	-	2·9
27	Callan	-	·4	66	Swineford	-	3·1
28	Castlecomer	-	·4	67	Newcastle	-	3·3
29	Castlereagh	-	·4	68	Middleton	-	3·4
30	Strokestown	-	·4	69	Gorey	-	3·5
31	Bailieborough	-	·5	70	Kilrush	-	3·5
32	Ballinasloe	-	·5	71	Boyle	-	3·6
33	Cootehill	-	·5	72	Ennistimon	-	3·6
34	Balrothery	-	·6	73	Clonakilty	-	3·8
35	Carrickmacross	-	·6	74	Ballymoney	-	4·0
36	Cavan	-	·6	75	Listowel	-	4·1
37	Celbridge	-	·6	76	Cork	-	4·2
38	Delvin	-	·6	77	Limerick	-	4·3
39	Mountbellew	-	·6	78	Lisnaskea	-	4·5

TABLE V.—*continued*.

No.	Superintendent Registrars' Districts (Poor Law Unions)	Rate	No.	Superintendent Registrars' Districts (Poor Law Unions)	Rate
79	Ennis -	4·6	123	Castlebar -	14·8
80	Killadysart -	4·8	124	Londonderry -	14·9
81	New Ross -	4·8	125	Corrofin -	16·0
82	Tipperary -	5·1	126	Clonmel -	16·2
83	Portumna -	5·5	127	Limavady -	16·4
84	Enniscorthy -	5·6	128	Westport -	16·6
85	Kilmallock -	5·8	129	Macroom -	16·9
86	Strabane -	5·8	130	Letterkenny -	18·0
87	Carrick-on-Shannon	6·5	131	Galway -	18·3
88	Omagh -	6·5	132	Tralee -	18·7
89	Thomastown -	6·5	133	Dunmanway -	19·5
90	Kanturk -	6·7	134	Dromore, West -	19·9
91	Ballymena -	7·1	135	Rathdrum -	20·1
92	Shillelagh -	7·2	136	Dungarvan -	20·5
93	Youghal -	7·9	137	Ballycastle -	20·7
94	Larne -	8·1	138	Ballyvaughan -	22·7
95	Mountmellick -	8·4	139	Castlederg -	22·7
96	Nenagh -	8·4	140	Tobercurry -	22·9
97	Naas -	8·5	141	Belmullet -	23·8
98	Carrick-on-Suir -	9·0	142	Killala -	24·5
99	Coleraine -	9·0	143	Dingle -	24·7
100	Loughrea -	9·1	144	Stranorlar -	24·9
101	Mallow -	9·1	145	Scarriff -	25·1
102	Clogher -	9·2	146	Killarney -	25·3
103	Enniskillen -	9·2	147	Rathdown -	25·6
104	Sligo -	9·2	148	Skull -	27·1
105	Fermoy -	10·2	149	Caherciveen -	28·8
106	Kilmacthomas -	10·4	150	Clogheen -	29·4
107	Newry -	10·4	151	Millford -	29·5
108	Tulla -	10·8	152	Glenties -	29·7
109	Magherafelt -	11·3	153	Oughterard -	30·1
110	Baltinglass -	11·6	154	Kenmare -	31·0
111	Cookstown -	11·8	155	Clifden -	32·8
112	Gort -	11·8	156	Inishowen -	36·5
113	Manorhamilton -	11·8	157	Kilkeel -	36·6
114	Ballinrobe -	11·9	158	Donegal -	37·8
115	Bawnboy -	12·1	159	Newport -	38·4
116	Dundalk -	12·2	160	Bantry -	39·3
117	Mitchelstown -	12·4	161	Dunfanaghy -	41·9
118	Millstreet -	12·6	162	Castletown -	42·5
119	Skibbereen -	13·4	163	Gortin -	44·3
120	Ballina -	13·5			
121	Dublin, South -	14·2		IRELAND -	10·4
122	Ballyshannon -	14·7			

TABLE VI.—DIVISION OF LAND, IRELAND, 1881.

Showing proportion per cent. under Bog and Marsh in each Poor Law Union, arranged from lowest to highest.

No.	Superintendent Registrars' Districts (Poor Law Unions)	Rate	No.	Superintendent Registrars' Districts (Poor Law Unions)	Rate
1	Dublin, North -	·1	46	Cashel -	2·7
2	Dunshaughlin -	·1	47	Limerick -	2·8
3	Kilkeel -	·2	48	Kells -	2·9
4	Drogheda -	·3	49	New Ross -	2·9
5	Lisburn -	·4	50	Ballyvaughan -	3·0
6	Balrothery -	·5	51	Cavan -	3·1
7	Celbridge -	·5	52	Dublin, South -	3·2
8	Callan -	·6	53	Strabane -	3·2
9	Clogheen -	·6	54	Skull -	3·4
10	Kilkenny -	·6	55	Mallow -	3·5
11	Croom -	·7	56	Clones -	3·6
12	Navan -	·7	57	Oldcastle -	3·7
13	Kilmallock -	·9	58	Trim -	3·7
14	Mitchelstown -	·9	59	Newcastle -	3·8
15	Newry -	·9	60	Larne -	4·1
16	Castlecomer -	1·0	61	Irvinestown -	4·2
17	Rathdown -	1·0	62	Dungarvan -	4·3
18	Banbridge -	1·3	63	Enniskillen -	4·3
19	Belfast -	1·4	64	Bailieborough -	4·3
20	Carrickmacross -	1·4	65	Londonderry -	4·3
21	Downpatrick -	1·4	66	Nenagh -	4·3
22	Newtownards -	1·4	67	Scarriff -	4·4
23	Dundalk -	1·5	68	Waterford -	4·4
24	Thomastown -	1·5	69	Baltinglass -	4·5
25	Ardee -	1·6	70	Carrick-on-Shannon	4·5
26	Cootehill -	1·6	71	Kanturk -	4·5
27	Tipperary -	1·6	72	Bantry -	4·7
28	Antrim -	1·8	73	Lisnaskea -	4·7
29	Gort -	1·8	74	Lurgan -	4·7
30	Rathkeale -	1·8	75	Skibbereen -	4·7
31	Youghal -	1·9	76	Athy -	4·8
32	Ennis -	2·0	77	Dungannon -	4·8
33	Carlow -	2·1	78	Clonakilty -	4·9
34	Clonmel -	2·1	79	Cork -	5·2
35	Gorey -	2·1	80	Killadysart -	5·2
36	Corrofin -	2·2	81	Sligo -	5·2
37	Carrick-on-Suir -	2·3	82	Rathdrum -	5·3
38	Armagh -	2·4	83	Coleraine -	5·4
39	Enniscorthy -	2·4	84	Limavady -	6·0
40	Kinsale -	2·4	85	Ennistimon -	6·2
41	Middleton -	2·5	86	Castletown -	6·3
42	Wexford -	2·5	87	Millford -	6·6
43	Castleblayney -	2·6	88	Ballycastle -	6·6
44	Fermoy -	2·6	89	Dingle -	6·7
45	Monaghan -	2·6	90	Abbeyleix -	6·9

Table VI.—*continued*.

No.	Superintendent Registrars' Districts (Poor Law Unions)	Rate	No.	Superintendent Registrars' Districts (Poor Law Unions)	Rate
91	Shillelagh -	6·9	129	Mountmellick -	11·0
92	Bawnboy -	7·0	130	Tuam -	11·5
93	Kilrush -	7·1	131	Galway -	12·2
94	Ballymena -	7·2	132	Tobercurry -	12·4
95	Magherafelt -	7·2	133	Inishowen -	12·9
96	Roscrea -	7·2	134	Granard -	13·0
97	Bandon -	7·2	135	Strokestown -	13·0
98	Millstreet -	7·6	136	Portumna -	13·1
99	Urlingford -	7·6	137	Ballymahon -	14·0
100	Cookstown -	7·7	138	Claremorris -	14·0
101	Donaghmore -	7·9	139	Loughrea -	14·2
102	Delvin -	8·0	140	Athlone -	14·4
103	Donegal -	8·1	141	Caherciveen -	14·4
104	Glin -	8·2	142	Dromore, West -	14·6
105	Kenmare -	8·2	143	Tullamore -	15·7
106	Tulla -	8·3	144	Westport -	16·0
107	Mullingar -	8·4	145	Swineford -	16·5
108	Tralee -	8·4	146	Longford	17·1
109	Borrisokane -	8·6	147	Oughterard -	17·1
110	Macroom -	8·7	148	Castlebar -	17·3
111	Ballyshannon -	8·8	149	Ballinasloe -	19·7
112	Clogher -	8·8	150	Glenties -	19·9
113	Thurles -	8·8	151	Stranorlar -	20·7
114	Killarney -	9·0	152	Castlereagh -	20·9
115	Letterkenny -	9·0	153	Mountbellew -	22·0
116	Boyle -	9·2	154	Glennamaddy -	23·2
117	Listowel -	9·3	155	Parsonstown -	24·6
118	Mohill -	9·3	156	Dunfanaghy -	24·7
119	Kilmacthomas -	9·4	157	Lismore -	24·8
120	Naas -	9·4	158	Clifden -	25·3
121	Castlederg -	9·6	159	Edenderry -	25·7
122	Ballinrobe -	9·7	160	Ballina	26·1
123	Ballymoney	9·7	161	Newport	27·8
124	Gortin -	9·9	162	Killala -	31·0
125	Dunmanway -	10·2	163	Belmullet -	43·5
126	Omagh -	10·5			
127	Manorhamilton -	10·9		IRELAND -	8·4
128	Roscommon -	10·9			

On a comparison of the map of the distribution of phthisis with an ordinary map of Ireland with mountain shading thrown, it will be observed that where most mountains are found there, as a rule, the lowest death-rates from phthisis prevail. This is most noticeable in Connaught, Kerry, West Donegal, and West Cork, where the death-rate from phthisis is low, and the mountains numerous and high. On the other hand, the level districts of Meath, Westmeath, Kildare, and the neighbouring counties have higher death-rates.

The accompanying map, with elevation shading already referred to, in which the portions of Ireland having an elevation of 500 feet and upwards are shaded in gray, further illustrates this fact. A comparison of this map with the map of the distribution of phthisis shows a close correspondence between the high death-rate area for phthisis and the less elevated district of the country. This map is also shaded in blue and red to illustrate the distribution of the rainfall in Ireland, and isobars denoting the distribution of atmospheric pressure are shown over its area. The rainfall shadings and isobars are, by the special permission of the author, copied from the maps contained in the valuable papers of Mr. Buchan on the Meteorology of the British Isles, published by him in the *Scottish Meteorological Journal.*

A comparison between the distribution of phthisis and the arrangement of the geological formation of the country does not point to any definite conclusion. A minute comparative analysis of these conditions is practically impossible, but a general view of a geological map of Ireland will show that where the nature of the geological formation favours the existence of mountain ranges or elevated lands there phthisis prevails least, and *vice versa ;* this is only another way of demonstrating that high elevation is unfavourable to the spread of phthisis and low-lying districts favour its prevalence. If we now turn to the Meteorological conditions we find that the main factors to be dealt with are temperature and rainfall.

In the valuable articles (already referred to) on " The Climate of the British Isles," by Mr. Alexander Buchan, in the *Journal of the Scottish Meteorological Society,* data are found for the investigation of the relation between the prevalence of disease and the prevailing meteorological conditions. From the latter, contained in Mr. Buchan's papers, I have constructed isotherms which are drawn on the maps illustrating the distribution of phthisis and of other diseases of the respiratory organs. Again, in the third map, I have, as already pointed out, illustrated the rainfall in connection with elevation and barometric pressure.

A comparison between the map in which the rainfall is marked and that illustrating the distribution of phthisis, shows that, as a

rule, where the rainfall is greatest the mortality from phthisis is least; but this again may be a mere coincidence, as the rainfall is greatest in the mountainous districts of the west of Ireland, where social and economic conditions exist which seem to be unfavourable to the prevalence of the disease. Again, the rainfall is greatest where the mountains are most numerous, and high elevations are almost universally admitted to be unfavourable to the prevalence of phthisis.

If we now consider the question of climate, as measured by the variations of temperature of the air, it will be found that in Ireland these have singularly little reference to the prevalence of phthisis. On the map of the distribution of phthisis there are three sets of isothermal lines showing the annual mean temperature, the mean temperature of winter in January, and of summer in July—that is, of the months which have the lowest and highest means in the year. It will be seen that there are two principal centres of excess of phthisis in the eastern side of Ireland—namely, Belfast and Dublin; and two principal centres of low prevalence on the western side—namely, Mayo and Kerry. If we compare the isotherms we find the following results, which may best be seen by setting them out in diagrammatic form :—

Difference.

Belfast
- Mean Annual Temperature - 49° — 10°
- Mean Summer Temperature - 59° — 9°
- Mean Winter Temperature - 40° — 19°

Dublin
- Mean Annual Temperature - 50° — 11°
- Mean Summer Temperature - 61° — 8·5°
- Mean Winter Temperature - 41·5° — 19·5°

Mayo
- Mean Annual Temperature - 49° — 9°
- Mean Summer Temperature - 59° — 7°
- Mean Winter Temperature - 42° — 16°

Kerry
- Mean Annual Temperature - 51° — 9°
- Mean Summer Temperature - 60° — 6·5°
- Mean Winter Temperature - 44° — 15·5°

It thus appears that the more equable temperatures are less favourable to the prevalence of phthisis. Where the differences are greatest there phthisis prevails most ; but, here again the maximal (gravity) of prevalence have their centres in great towns, and the minimal in rural districts. An attempt to compare the prevalence of phthisis with the mean barometric pressure yields no results whatever. I cannot, however, say that I anticipated any result from a comparison of mean isobars with the prevalence of phthisis, as I believe such relations would only be found to exist in so far as they themselves are related to mean temperature and rainfall.

In the early part of this paper I referred to the distribution of deaths from diseases of the " respiratory organs" other than phthisis, which for convenience sake we shall call " other lung diseases," in Ireland, and showed by the diagram that these forms of disease have a very different distribution from phthisis. A comparison of the map of the distribution of " other lung diseases" with the phthisis map shows that while phthisis prevails most along the eastern side of Ireland, other forms of lung disease prevail most in the south ; and it will be observed that there is little correspondence between the colourings and shadings in the two maps ; but in districts in which large towns are situated, where the phthisis death-rate is above average, the death-rate from " other lung diseases" is also above average, except in the districts of Galway, Londonderry, Sligo, and Drogheda.

From Table VII., where the districts are arranged in order from the lowest to the highest, according to death-rates from "diseases of the respiratory organs (exclusive of phthisis)," we find that the death-rates range from 8·7 per 10,000 of the mean population in Belmullet to 53·3 in the South Dublin district. The average rate, 27·0, is found at Thurles : there are 118 districts with death-rates below, and 44 (including 15 districts containing towns with over 10,000 inhabitants) where the rate is above the average. The 118 districts with death-rates below average include only four town districts, thus showing how town life favours the prevalence of other fatal forms of lung disease as well as of phthisis.

Table VII.—Respiratory Organs.

Showing Average Annual Rate (1871–80) per 10,000 of the Mean Population, represented by Deaths from Diseases of Respiratory Organs (exclusive of Phthisis), in each of the Poor Law Unions, arranged from lowest to highest.

No.	Poor Law Unions	Rate	No.	Poor Law Unions	Rate
1	Belmullet -	8·7	45	Carrickmacross -	18·9
2	Strokestown -	11·3	46	Mullingar -	19·0
3	Oughterard -	11·8	47	Claremorris -	19·0
4	Dromore, West -	12·3	48	Galway -	19·3
5	Boyle -	12·3	49	Larne -	19·4
6	Longford -	12·4	50	Ballymena -	19·5
7	Ballyshannon -	12·7	51	Gort -	19·6
8	Glenties -	13·2	52	Macroom -	19·6
9	Caherciveen -	13·2	53	Granard -	19 7
10	Tobercurry -	13·4	54	Tralee -	19·8
11	Clifden -	13 5	55	Dunfanaghy -	19·9
12	Gortin -	13·7	56	Londonderry -	20·1
13	Castlereagh -	14·6	57	Ballinrobe -	20·3
14	Newport -	15·1	58	Lismore -	20·4
15	Tulla -	15·2	59	Strabane -	20 6
16	Oldcastle -	15·3	60	Rathdrum -	20·7
17	Tuam -	15·3	61	Antrim -	21·0
18	Swineford -	15·4	62	Clogher -	21·0
19	Listowel -	16·0	63	Inishowen -	21·1
20	Castlebar -	16·0	64	Cavan -	21·1
21	Ballycastle -	16·2	65	Omagh -	21·2
22	Manorhamilton -	16·2	66	Sligo -	21·2
23	Loughrea -	16·4	67	Skull -	21·3
24	Ballinasloe -	16·8	68	Ballyvaughan -	21·4
25	Killala -	16·8	69	Killadysart -	21·4
26	Kenmare -	16·9	70	Tullamore -	21·5
27	Castlederg -	17·0	71	Coleraine -	21·6
28	Donegal -	17·0	72	Corrofin -	21·6
29	Athlone -	17·4	73	New Ross -	21·6
30	Roscrea -	17·4	74	Magherafelt -	22·1
31	Ballina -	17·4	75	Delvin -	22·1
32	Ballymoney -	17·5	76	Glennamaddy -	22·3
33	Kilkeel -	17·6	77	Ennistimon -	22·4
34	Borrisokane -	17·6	78	Enniskillen -	22·4
35	Westport -	17·7	79	Mountmellick -	22·5
36	Donaghmore -	17·9	80	Trim -	22·6
37	Parsonstown -	18·0	81	Shillelagh -	22·9
38	Letterkenny -	18·1	82	Portumna -	22 9
39	Stranorlar -	18·2	83	Youghal -	22·9
40	Abbeyleix -	18·4	84	Dunmanway -	22 9
41	Millford -	18·5	85	Lisnaskea -	23·1
42	Kilrush -	18·6	86	Killarney -	23·4
43	Irvinestown -	18·7	87	Navan -	23·4
44	Limavady -	18·9	88	Cookstown -	23·5

TABLE VII.—*continued.*

No.	Poor Law Unions		Rate	No.	Poor Law Unions		Rate
89	Bantry	-	23·8	128	Bandon	-	28·6
90	Dungannon	-	23·9	129	Newry	-	29·0
91	Baltinglass	-	23·9	130	Wexford	-	29·1
92	Ballymahon	-	23·9	131	Lisburn	-	29·2
93	Naas	-	24·2	132	Cootehill	-	29·7
94	Downpatrick	-	24·3	133	Fermoy	-	29·7
95	Gorey	-	24·4	134	Lurgan	-	29·9
96	Kells	-	24·5	135	Glin	-	29·9
97	Skibbereen	-	24·5	136	Bailieborough	-	30·0
98	Ennis	-	24·7	137	Celbridge	-	30·9
99	Balrothery	-	24·7	138	Clogheen	-	30·9
100	Banbridge	-	24·8	139	Waterford	-	31·2
101	Tipperary	-	24·8	140	Rathkeale	-	31·2
102	Clonakilty	-	24·8	141	Croom	-	31·3
103	Mohill	-	24·9	142	Armagh	-	31·4
104	Carrick-on-Shannon		25·0	143	Dundalk	-	31·6
105	Newcastle	-	25·0	144	Kilkenny	-	31·6
106	Carlow	-	25·1	145	Roscommon	-	31·8
107	Edenderry	-	25·2	146	Carrick-on-Suir	-	32·0
108	Drogheda	-	25·3	147	Rathdown	-	32·3
109	Athy	-	25·6	148	Middleton	-	32·5
110	Mountbellew	-	25·6	149	Limerick	-	33·5
111	Bawnboy	-	25·6	150	Mallow	-	34·0
112	Newtownards	-	25·8	151	Kanturk	-	35·5
113	Castletown	-	26·1	152	Castlecomer	-	36·0
114	Dingle	-	26·4	153	Dungarvan	-	37·5
115	Monaghan	-	26·7	154	Cork	-	38·7
116	Urlingford	-	26·8	155	Cashel	-	40·0
117	Kinsale	-	26·8	156	Mitchelstown	-	41·3
118	Callan	-	26·9	157	Thomastown	-	42·2
119	Thurles	-	27·0	158	Kilmacthomas	-	46·3
120	Castleblayney	-	27·3	159	Clonmel	-	48·1
121	Scarriff	-	27·3	160	Belfast	-	49·9
122	Ardee	-	27·4	161	Kilmallock	-	50·3
123	Nenagh	-	27·5	162	Dublin, North	-	52·9
124	Enniscorthy	-	27·8	163	Dublin, South	-	53·3
125	Clones	-	28·0				
126	Millstreet	-	28·2		IRELAND	-	27·0
127	Dunshaughlin	-	28·2				

Looking at the distribution of the shading on either side of
the line A B in the map relating to diseases of the respiratory
organs, other than phthisis, we find a condition of things similar
to that found in the phthisis map. The most marked feature
in the map is the blue shading over considerable portions of
the counties of Down, Armagh, Monaghan, Cavan, and Louth
towards the North-east, and of Cork, Limerick, Tipperary, Kil-

MAP OF IRELAND.

Average Annual Rate 1871–80,
per 10,000 of Mean Population,
represented by Deaths from the

DISEASES OF THE

RESPIRATORY ORGANS

(Exclusive of Phthisis)
in each Poor Law Union.

Districts containing towns with
Population of 10,000 & upwards,
marked thus O

ISOTHERMALS shewing the
MEAN TEMPERATURE
Annual
January
July

Death rates
per 10,000 of Population,
1871–80.

Under 12
12 under 17   Under
17 under 22   Average
22 under 27
Average for
Ireland 27.0
27 under 32
32 under 37   Above
37 under 42   Average
42 under 47
47 & upwards

F. Huth, Lith.ʳ Edin.ʳ
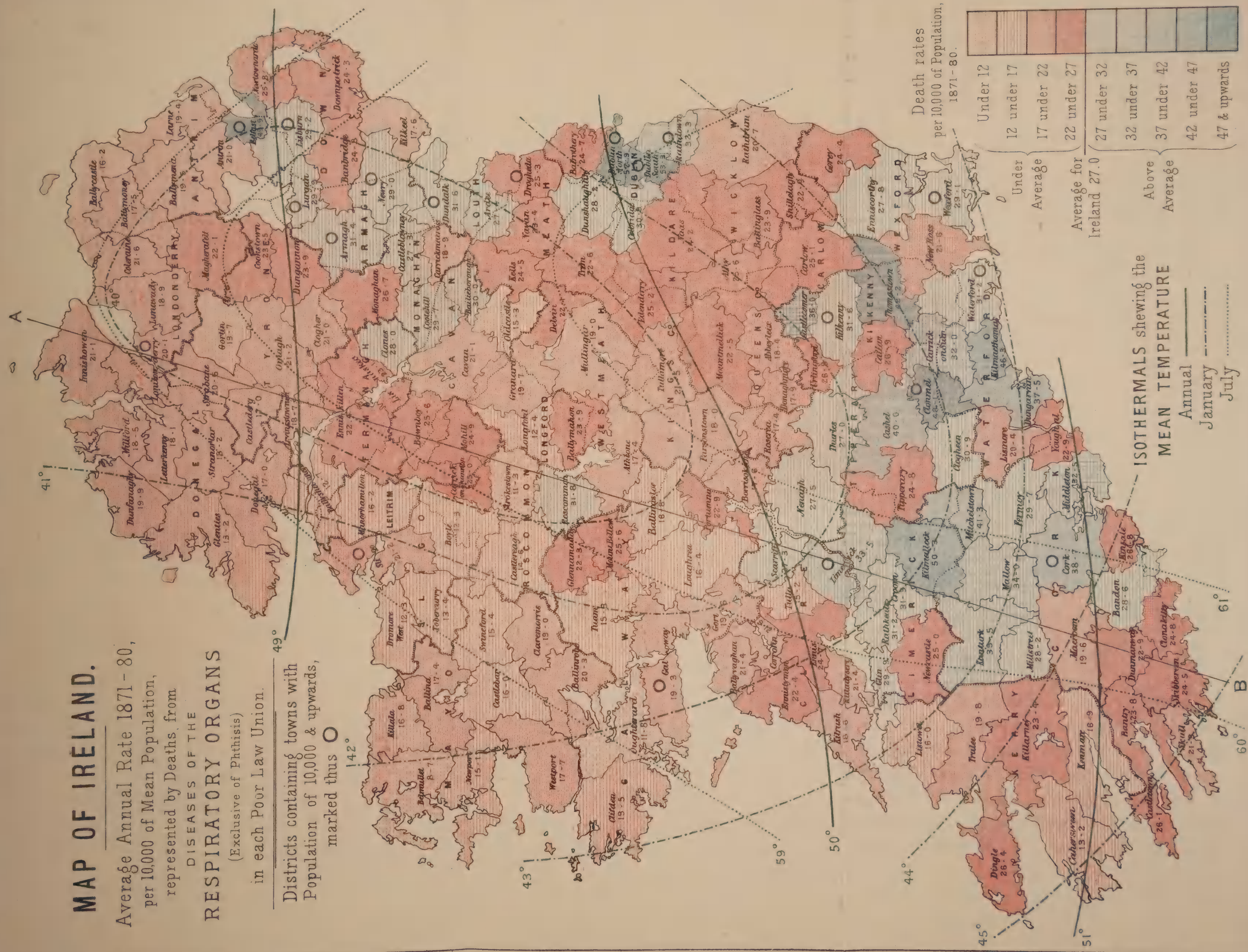
kenny and Waterford in the South. The group of districts in the North-east includes many towns, the Southern group but few; yet in the latter we see the blue shading, as a rule, more intense than in the former group. Climatic conditions can scarcely be considered sufficient to account for the difference.

The already inordinate length of this paper prevents me making further analysis or comparing many details which, while raising important and curious points, do not seem to me to tend towards any very definite conclusions.

I do not think it advisable here to enter into a comparison of the results arrived at by me with those of others, especially Mr. Haviland,[a] the originality and ability of whose writings on the geographical distribution of disease are unapproached by those of any other investigator. I would also refer to the interesting and valuable paper by Mr. Buchan and Dr. Arthur Mitchell,[b] on the influence of weather on mortality from different diseases and at different ages.

In conclusion, I have to thank Mr. Buchan for so liberally placing his maps and tables at my disposal, and Mr. R. H. Scott, of the Meteorological Office, for the valuable advice and assistance he has given me in dealing with the meteorological facts connected with the question under consideration.

[a] Haviland's Geography of Heart Disease, Cancer, and Phthisis. London : Smith, Elder & Co. 1875.

Consumption : its Social and Geographical Causes, &c., by Alfred Haviland. Douglas (Isle of Man): Browne & Sons. 1883.

[b] Journal of the Scottish Meteorological Society, July, 1874 ; July, 1875. Edinburgh : Blackwood & Sons.

SUB-SECTION OF ANATOMY AND PHYSIOLOGY.

VARIATIONS IN THE NERVE-SUPPLY OF THE LUMBRICAL MUSCLES IN THE HAND AND FOOT, WITH SOME OBSERVATIONS ON THE INNERVATION OF THE PERFORATING FLEXORS.

By H. ST. JOHN BROOKS, M.B. & B.Ch.;

Demonstrator of Anatomy, University of Dublin.

[Read in the Sub-Section of Anatomy and Physiology, February 10, 1887.]

ENGLISH anatomists are uniform in their descriptions of the innervation of the lumbricals, but in Continental text-books some discrepancies may be observed, and variations are admitted to exist. As far as I am aware, however, a *double* supply to any one of these muscles has not been described, nor has any account been published of the second[a] lumbrical in either the hand or foot receiving its nerve on its deep surface. My investigations of the nerve-supply of the short muscles of the thumb,[b] which render it probable that a struggle, as it were, is going on between the median and ulnar nerves in the hand, led me to examine the innervation of the short muscles of the hallux and the nerves to the lumbrical muscles of the hand and foot. The results I have obtained increase the probability that in both hand and foot the deep nerve (ulnar in hand, external plantar in foot) is gradually displacing the superficial (median, internal plantar). I may dismiss the hallucial muscles by stating that in about twenty-five feet that I examined,

---

[a] Throughout this paper the lumbricals are numbered in the usual way, commencing with the radial side of the hand and the tibial side of the foot.

[b] Brooks. Jour. of Anat. and Phys., Vol. XX., p. 641 ; and Trans. Acad. of Med. in Ireland, Vol. IV., p. 434.

I found but two cases of variation in nerve-supply. In these two cases the internal plantar gave twigs to the adductor hallucis, and communicated, in the substance of that muscle, with the deep external plantar. In no case did I find the deep external plantar supplying the outer or fibular head of flexor brevis hallucis, although this is said to be the normal arrangement by Henle[a] and Schwalbe.[b]

Quain, Ellis, and Gray are all agreed that in the hand the two outer lumbricals are supplied by the median, and the two inner by the deep branch of the ulnar nerve; and that in the foot the two inner lumbricals receive their nerves from the internal plantar and the two outer from the deep branch of the external plantar. Henle[c] considers the above arrangement to be the rule in the hand, but mentions that the third (annular) lumbrical may be supplied by the median, and that the fourth lumbrical may receive its nerve from the superficial division of the ulnar. In the foot, he says that the internal plantar supplies the first, or the first and second, and that the *superficial* branch of the external plantar, which divides to supply the adjacent sides of the fourth or fifth toes, supplies those lumbricals which are not supplied by the internal plantar. W. Krause[d] does not mention any varieties either in the hand or foot. Schwalbe[e] agrees with Henle with regard to the hand; in the foot he states (with the English anatomists) that the two inner lumbricales are supplied by the internal plantar, but describes (like

[a] Nervenlehre, 1879, p. 593.

[b] Neurologie, 1881, p. 977. A branch of the deep external plantar is often seen ramifying upon the periosteum of the first metatarsal bone, but gives off no twigs to the muscles. I traced this periosteal twig with great care in both feet of a Chimpanzee, but in this anthropoid, as in the Orang and the Gibbon, I could not find a twig from the deep external plantar nerve to any part of the flexor brevis hallucis. In his researches into the nerves of the mammalian foot, Professor Cunningham found in the Fox-bat the outer (fibular) belly of the flexor brevis hallucis supplied by the deep external plantar. In every other mammal that he examined, both heads of the muscle were supplied (as in man) by the internal plantar nerve (Zoology of the Challenger, Vol. XVI., p. 135).

[c] Op. cit., pp. 538, 539, 542, 591.

[d] Handbuch der menschlichen Anatomie, Varietäten, &c., 1880.

[e] Op. cit., pp. 926, 930, 976, 977.

Henle) the two outer muscles receiving their nerves from the *super-ficial* division of the external plantar.

I have carefully searched for the nerves on both the superficial and deep aspects of the lumbricals in nineteen hands and ten feet; also for the superficial nerves in two additional hands in which I had not an opportunity of carrying out the deep dissection. I have never seen (in man) either the third or fourth lumbrical of the foot supplied on its superficial surface (as described by Henle and Schwalbe). I have found, however, the third lumbrical of the hand receiving a twig from the median in twelve out of twenty-one cases; in nine cases (out of the twelve) the third lumbrical also received a twig from the deep branch of the ulnar. The two nerves usually communicated in the substance of the muscle, after supplying it with twigs. They were inversely proportional in size, so that if the median twig was large I could predict a small ulnar twig, and *vice versa*. In three or four of the examples the median twig was very minute, and in one case the ulnar twig was reduced to an exceedingly small thread. This may explain why this double supply has been so generally overlooked. In only one case did I find the contribution from the deep ulnar to the third lumbrical absent; in this case the median twig was large.

In the ten feet which I examined, I found a remarkable uniformity. In nine out of the ten cases the three outer (fibular) lumbricals were supplied by the deep division of the external plantar, the first or innermost lumbrical alone receiving its nerve from the internal plantar. The branch to the second lumbrical from the internal plantar, described as normal by all anatomists except Henle, was conspicuous by its absence. Nor could Henle's description be verified, as no twigs from the superficial division of the external plantar were observed. The nerve, which was in all these cases large—indeed usually the largest of the four lumbrical nerves, arose from the deep division of the external plantar. It ran forwards under cover of the transversalis pedis, and winding round the anterior border of that muscle, took a recurrent course upon its superficial surface to reach the second lumbrical. Prof.

Cunningham, to whom I showed several of these nerves, informed me that the appearance of the nerve was familiar to him, and on referring to his unpublished notes of the "Anatomy of the Negro Foot," he found a similar case recorded. The recurrent course of this nerve is interesting in connection with Ruge's[a] embryological observations, which show that the transversalis pedis (adductor transversus) in the embryo lies close to the adductor hallucis (a. obliquus), and gradually travels forwards to the position which it occupies in the adult. In this journey it has pushed the nerve before it and has dragged it into its present looped condition, very much in the same manner that the descent of the embryonic branchial arterial arches gives rise to the recurrent course of the inferior laryngeal nerve. In one case I found the nerve to the third lumbrical taking a similar recurrent course.

In the remaining case the external plantar had still further encroached on the domain of the internal plantar nerve. The four lumbrical muscles *all* received twigs from the deep division of the external plantar. In addition to this, the two inner lumbricals received twigs on their superficial surfaces from the internal plantar. With regard to the nerve to the second lumbrical from the internal plantar (generally considered to be the normal nerve-supply), this was the only case out of the ten in which I could discover it. I believe it to be minute and inconstant, certainly not normal. Its absence in some of the cases may have been due to the too hasty removal of the plantar fascia by the dissector of the part, before it came under my observation ; but in at least three of the cases the whole dissection was performed by myself, and the feet were in excellent condition. Dr. J. M. Purser, Professor of the Institutes of Medicine in this University, kindly made a microscopical examination of the nerve from the deep external plantar to the first lumbrical, and confirmed its nervous character. In several of the other cases (detailed in the following table) I made a similar examination of the nerves myself, although the nervous character was unmistakable to the naked eye. On excising the nerve with a portion of the

[a] Processes in the Development of the Muscles of the Human Foot. Morphologisches Jahrbuch, 1878, p. 132.

muscle attached, and teasing up in a little dilute acetic acid, the nerve-fibres could be seen entering the muscular substance.

I searched carefully for the corresponding nerve in the hand, and after looking in vain in sixteen hands I was rewarded by finding the nerve in the seventeenth subject I examined. It was at least half the size of the ordinary nerve from the median, and it communicated with the latter on the radial side of the muscle; in this example (as in the nine cases of double supply to the third lumbrical) it was a true double supply; not a mere communication. Previous to their junction, both nerves sent two or three twigs, the median to the superficial aspect, the ulnar to the deep surface, of the second lumbrical muscle. Like the corresponding nerve in the foot, it ran downwards under cover of the adductor pollicis (adductor transversus), but owing to the more proximal position of that muscle, did not become recurrent as in the foot. In another case which appears in the subjoined table *all* the lumbrical muscles of the hand received nerves on their superficial surfaces—the three outer from the median, and the fourth from the branch of the *superficial* division of the ulnar, which divides to supply the adjacent sides of the fourth and fifth fingers. The twigs which entered the superficial surfaces of the third and fourth lumbricals were small, and were supplemented by branches from the deep division of the ulnar nerve, which entered the same two muscles.

In the foot of an Orang (*Pithecus*) I found the first lumbrical supplied by the internal plantar, and the second and third by the deep division of the external plantar. The nerve to the fourth lumbrical was not noted. In the foot of a Gibbon (*Hylobates agilis*) the innervation of the first three lumbricals was similar, the fourth was supplied by the *superficial* division of the external plantar. In the hand of the same animal the arrangement was :—First and second lumbrical muscles by median nerve; third and fourth lumbricals by deep ulnar nerve. In the hand and foot of a Macaque Monkey (*Macacus nemestrinus*) the arrangement was present which I believe more extended observations will show to be the commonest in the human subject, viz. :—*In the foot ;* first lumbrical by internal plantar; second, third, and fourth lumbricals by deep external plantar. *In*

the hand ; first and second lumbricals by median ; fourth lumbrical by deep ulnar ; third muscle with a double supply. In this monkey, however, the median twig to the third lumbrical was the larger ; in the human subject the reverse is usually the case. In all these animals the nerve to the second lumbrical in the foot pierced the adductor transversus, and did not take the recurrent course which it does in man.

Table of the Innervation of the Lumbrical Muscles in Man.

Hand Lumbricals.

First and second by median ; third and fourth by deep
    ulnar, ... 9 cases.

First and second by median ; third by median and deep
    ulnar ; fourth by ulnar only, . . . 7 ,,

First by median only ; second and third by median and
    deep ulnar ; fourth by ulnar only, . . 1 ,,

First, second, and third by median ; fourth by deep
    ulnar, ... 1 ,,

First and second by median ; third by median and deep
    ulnar ; fourth by both superficial and deep divi-
    sions of ulnar, ... 1 ,,

First, second, and third by median (deep dissection not
    carried out), ... 2 ,,

            Total, ... 21 cases.

Foot Lumbricals.

First by internal plantar ; second, third, and fourth by
    deep external plantar, ... 9 cases.

First and second by both internal plantar and deep ex-
    ternal plantar ; third and fourth by deep external
    plantar only, ... 1 ,,

            Total, ... 10 cases.

These observations, in conjunction with Schwalbe's description of the innervation of the two outer lumbricals of the foot, led me

to formulate the following theory :—*The lumbricals were originally all supplied on their superficial surface; and the deep nerve is gradually displacing the superficial.* A priori, the deep nerve must have an advantage over the superficial in a situation so constantly exposed to pressure as the palm of the hand and the sole of the foot—and it is noteworthy that in the foot, where the pressure is most constant, the deep nerve has the second lumbrical fairly in its grip, and is even advancing to the first lumbrical, while in the hand it is still struggling (if we may call it this) for the third lumbrical, and is apparently only commencing, in man, to dispute the possession of the second lumbrical with the superficial nerve (median). The condition of the nerves in certain primitive forms of Mammals (Marsupials) and in the Fox-bat, affords strong evidence in favour of this view.

In the Manus of *Cuscus* and *Thylacinus* the median nerve supplies all the lumbrical muscles.[a] " In the fox-bat the lumbrical muscles of the foot, which are very highly developed, are each furnished with a twig which enters its superficial surface. In the case of the inner muscles, this twig comes from the internal plantar; but in the case of the outermost lumbrical, the nerve-filament is derived from the external plantar. It is right to mention, however, that the two outer lumbricals are also supplied by twigs from the external plantar which enter their deep surfaces." [b]

For the following I am indebted to some unpublished notes which Professor Cunningham has kindly placed at my disposal. In *Cuscus* the internal plantar nerve supplies the three inner (tibial) lumbricals. In the Lemur the internal plantar supplies the two inner lumbricals; the two outer muscles receive twigs, on their plantar surface, from the *superficial* division of the external plantar; there is also a decided branch from the deep division of that nerve for the fourth lumbrical, but none for the others.

In his article upon the relation of nerve-supply and muscle homology, Professor Cunningham states that from his study of

---

[a] Zoology of the Challenger. Cunningham. Vol. XVI., p. 31.
[b] Cunningham. The Relation of Nerve Supply to Muscle Homology. Journal of Anatomy and Physiology, Vol. XVI., p. 7.

the innervation of the intrinsic muscles of the mammalian pes and manus he has been led to believe that the domain of the internal plantar and median nerves has originally been more extensive, and that a tendency is exhibited by the external plantar and ulnar to encroach upon the territory of the median and internal plantar. In my researches into the nerve-supply of the flexor brevis pollicis, I have been able to extend this generalisation to man (as already mentioned in the opening paragraph of this paper), and to show that the struggle between the two opposing nerves of the hand may be studied, even when we confine our attention to one species. It is most satisfactory to find such ample corroboration of these views in the facts which I have detailed in connection with the lumbrical muscles.

It appears probable that when there is an advance in respect to the thumb muscles, there is a retreat on the part of the ulnar nerve in respect to the lumbricals (see Plate, Figs. 1, 2, and 7). An inspection of Figs. 1 to 7, however, will show that no hard and fast rule can be laid down in the hand. A study of the foot renders the case more clear; in the hand the deep ulnar has obtained a share of the innervation of the *radial* head of flexor brevis pollicis,[a] but in the foot, with the solitary exception of the Fox-bat,[b] it has not even commenced to supply the fibular head of flexor brevis hallucis; the converse is the case with the innervation of the lumbrical muscles, as I have already sufficiently shown.

Dr. J. A. Russell, formerly Senior Demonstrator of Anatomy in the University of Edinburgh, adopted the following generalisation in teaching the nerve-supply of the lumbricals in the hand:— " These muscles are associated with the flexor profundus digitorum from the tendons of which they spring, and it will be remembered that the inner portion of this muscle is supplied by the ulnar; so are the lumbricals in connection with it. Again, the outer part of the flexor profundus is supplied by the median, and so are the lumbricals which arise from the two outer tendons."[c]

[a] Brooks. Loc. cit.
[b] See footnote, p. 341.
[c] The Dissector's Guide. Cunningham. Part I., 1879, p. 46.

It appeared to me that this ingenious method of teaching involved a morphological principle which it would be well to extend. Our English text-books all state that the two inner divisions of the flexor profundus digitorum are supplied by the ulnar, and the two outer by the median. Henle,[a] however, says that the indicial belly is supplied by the median, and the other three divisions by the ulnar. He once saw the division for the middle finger with a double supply.[b]

In four fore-arms which I examined I found the indicial belly with a median supply, the division for the little finger innervated solely by the ulnar, and the divisions appertaining to the middle and ring fingers, each with a double nerve supply. In a fifth case the median gave branches to all four bellies, and the ulnar contributed to the innervation of the three inner divisions of the muscle.

In every case in which one of the divisions of the muscle had a double nerve-supply, the ulnar supplied the upper part of the muscular belly and the median was distributed to the lower part. As a general rule the nervous twigs communicated in the substance of the muscle. A glance at Figs. 2′, 3′, 7′ and 8 will show the relation between the innervation of a particular belly of the flexor profundus and the nerve-supply of the lumbrical muscle attached to its tendon in the hand. It is evident that there is a *general correspondence* between the two; thus the indicial belly and the first lumbrical are always exclusively supplied by the median; the fourth belly and fourth lumbrical are typically supplied by the ulnar only; and the third belly and lumbrical have usually a double supply. In the fore-arm, however, the median nerve is holding on more perversely to its portion of the flexor profundus than to the lumbricals in the hand.

In attempting to institute this comparison in the lower limb we are met by three difficulties:—(1) There are two perforating flexors—for the flexor longus hallucis gives contributions to the tendons of the flexor longus digitorum (Turner, *Trans. Roy. Soc. Edin.*, 1865). (2) Neither of these muscles can be divided into

---

[a] Nervenlehre, p. 536.
[b] Muskellehre, p. 210.

separate bellies corresponding to the tendons for the toes. (3) The two plantar nerves diverge at the ankle instead of running separate courses in the limb, like the median and ulnar. (1) An inspection of a few examples of the Mammalia (especially the Marsupials) shows us that the chief muscle is the flexor longus hallucis, the flexor digitorum longus being merely an accessory muscle; the nerve-supply of the flexor longus hallucis is, therefore, the more important, but the innervation of the flexor longus digitorum should also be studied. (2) The second difficulty presents a much greater obstacle to our research.

In order to resolve the posterior tibial into its two constituent plantar nerves, I excised the internal popliteal, posterior tibial, and the two plantar nerves in three subjects, taking care to preserve the nerves of supply to the two perforating flexors. I then placed the whole system under water in a cork-lined tray and proceeded to unravel it. Each plantar nerve was seen to consist of about five *rounded cords*,[a] which showed but little tendency to subdivision, and evidently consisted of closely associated nervous bundles, these "cords" were followed up to the lower part of the internal popliteal nerve, where the nerve to the flexor longus hallucis was seen to arise by two roots derived from "cords" belonging to the internal and external plantar nerves respectively; the branch to the flexor longus digitorum was given off from the external plantar division. In a second case there were two nerves to the flexor longus hallucis; the upper one arose from the external plantar division near the popliteal space, and the lower nerve not far above the ankle from the internal plantar division; the nerve to the flexor longus digitorum was not traced. A third case gave negative results, as there was a plexiform arrangement of fibres in the region of the internal popliteal nerve. I do not attach much importance to these latter observations, they are simply suggestive, and seem to indicate that

[a] A microscopical examination of a transverse section of the nerve (taken from a portion of the trunk immediately above the part which was unravelled) showed that each of these *cords* consisted of three or four bundles of nerve-fibres, surrounded by separate sheaths of perineurium, the group of three or four being bound together by a condensed layer of epineurium, and thus partially segregated from the remainder of the nerve-trunk.

in the leg, as in the fore-arm, the perforating flexors may have a double supply.

In conclusion, I beg to express my thanks to Professor Cunningham, not only for his kindness in allowing me to use his notes, but also for placing the Anthropoids and Macaque Monkey at my disposal. I must also say that without the kind co-operation of the students attending the Anatomical Class in this University, much of this work would have been very difficult. In many cases, at considerable inconvenience to themselves, they delayed their work in order to give me an opportunity to complete my examination of the nerves in the parts they were dissecting.

EXPLANATION OF PLATE.

Figs. 1 to 7. Diagrams to illustrate the nerve-supply of the thumb muscles and lumbricals, as observed in the dissection of nine subjects. (Figs. 3 and 7 each represent the arrangement seen in two subjects.) The numbers 1, 2, 3, and 4 indicate the lumbricals numbered from the radial to the ulnar side. *A,* true outer head of flexor brevis pollicis ; *B,* portion of the "inner head of flexor brevis" inserted into the radial sesamoid of the thumb ; *D,* "inner head of flexor brevis." In Vol. IV. of these "Transactions" I have used the letters $f'r$, $a'a$, and $a'ob$ to denote *A, B,* and *D* respectively. *M.* median nerve ; *r.p.u.,* deep branch of ulnar. These figures are diagrammatic transverse sections, and no attempt has been made to indicate the exact course of the nerves. In Figs. 2′, 3′, 7′ and 8, the upper row of circles represent the lumbricals, and the lower row the corresponding bellies of the flexor profundus digitorum. Fig. 3′ represents the arrangement in two subjects, from one of which Fig. 3 was taken ; Figs. 2′ and 7′ are taken from the same subjects as Figs. 2 and 7. *M,* median ; *U,* ulnar nerve.

Figs. 1 to 7 are placed in the order in which the displacement of the median by the ulnar nerve takes place. In Fig. 1 the median supplies *A, B,* and *D* as well as the two outer lumbricals. In Fig. 7 the median is only left in possession of the two outer lumbrical muscles, and a share of the third lumbrical. Figs. 2 to 6 represent the intermediate steps of this displacement. One point is very evident—viz., that the advance of the ulnar may not be carried on equally in respect to the thumb and lumbrical muscles.

Fig. *[partially visible, top right]*

Fig. 1.

Fig. 3.

Fig. 5

Fig. 7.

Fig. 2.

M

r.p.u.

U

Fig. 4.

M

U

A

B

D

r.p.u.

M

Fig. 6.

A

B

D

r.p.u.

Fig. 8.

M

r.p.u.

U

LUMBRICALES.
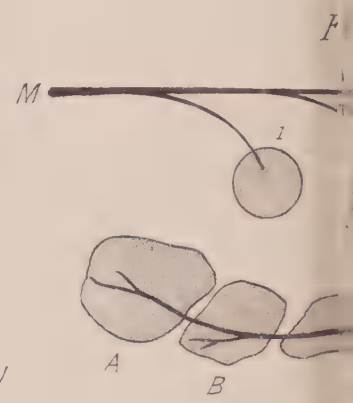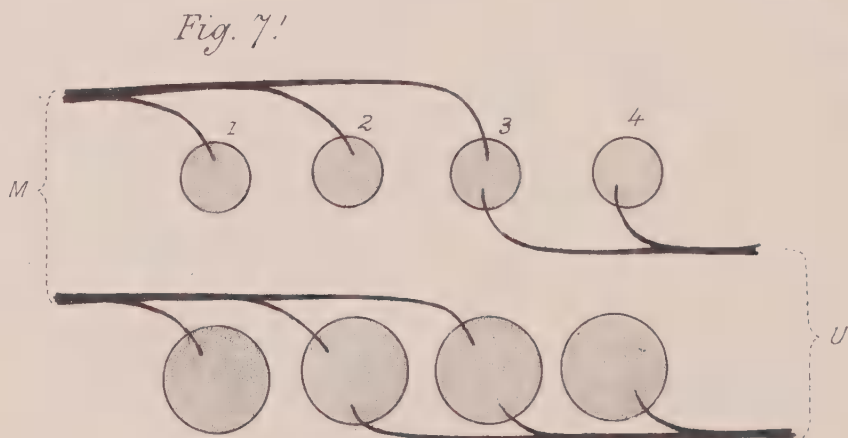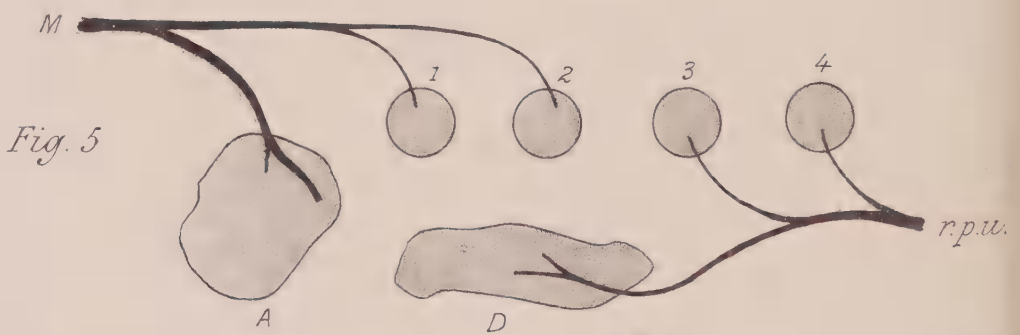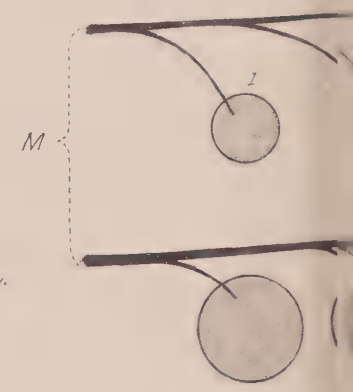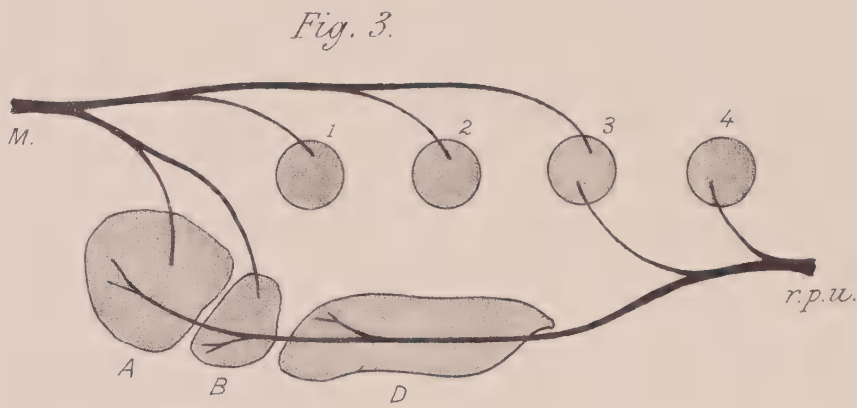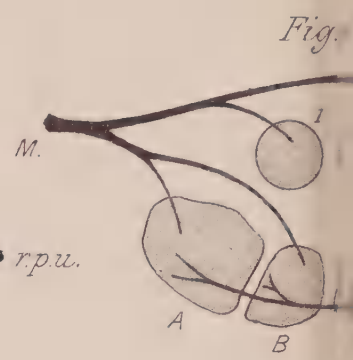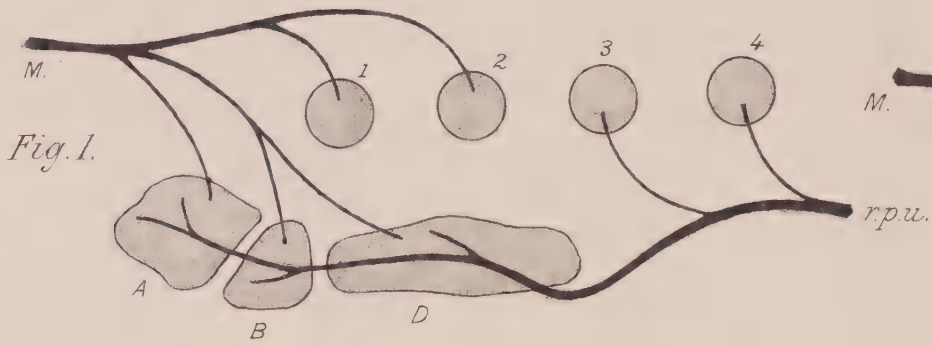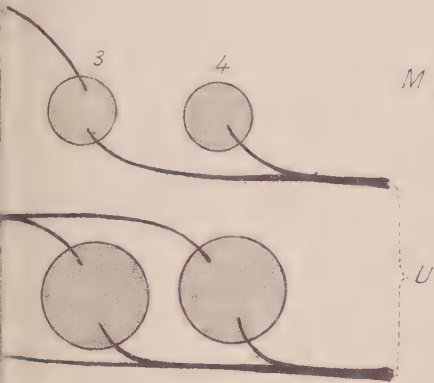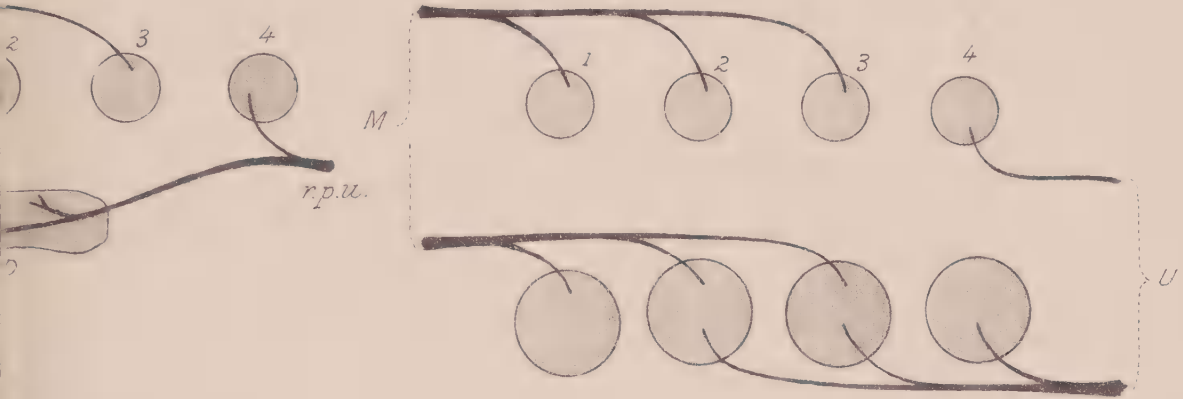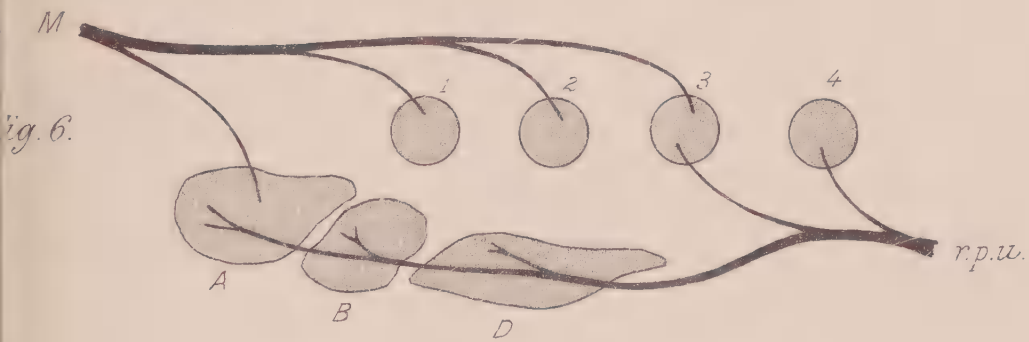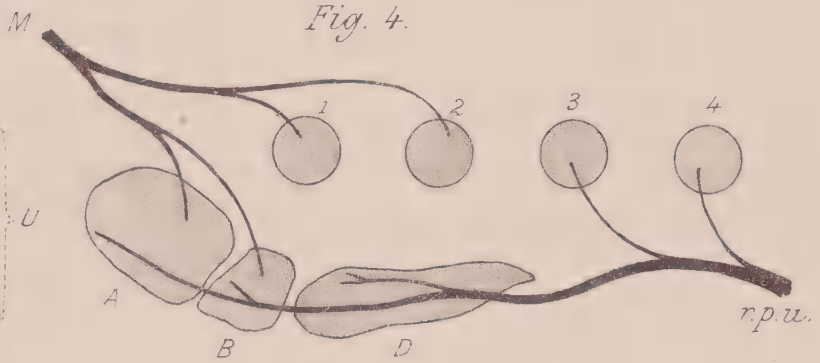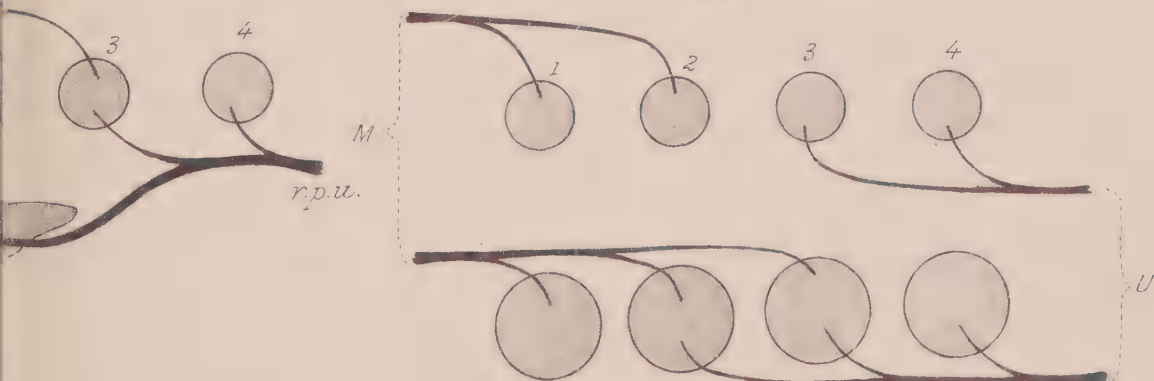
VARIETIES IN THE MODE OF ORIGIN OF THE PHRENIC NERVE, WITH SOME NOTES ON NERVE-VARIATIONS IN THE SUPERIOR EXTREMITY.

By H. ST. JOHN BROOKS, M.D.;
Demonstrator of Anatomy in the University of Dublin.

VARIATIONS in the mode of origin of the phrenic nerve are known to be by no means uncommon; and while all anatomists are agreed that the principal root is derived from the fourth cervical nerve, there appears to be a little uncertainty about the relative frequency of its smaller or accessory roots. It is described as follows in Quain's Anatomy:[a]—"It arises mainly from the fourth cervical nerve, but it also receives, in the majority of instances, an additional root from either the third or the fifth nerve. While descending in the neck, the nerve inclines inwards over the anterior scalenus muscle; and near the chest it is joined by a filament of the sympathetic, sometimes also by another filament given off by the branch proceeding from the fifth and sixth cervical nerves to the subclavius muscle."

On page 589 of the same work we are told that occasionally a filament from the *ansa hypoglossi* "is continued to the thorax, where it joins the cardiac and phrenic nerves." With regard to the nerve to the subclavius muscle, it is described on page 605 as arising "from the front of the cord which results from the union of the fifth and sixth cervical nerves."

We learn from this description that the phrenic nerve may receive three roots *directly* from the third, fourth, and fifth cervical

---

[a] Ninth edition, 1882, Vol. I., p. 601.

nerves, and *indirectly*, through the nerve to the subclavius, filaments from the fifth and sixth cervical nerves; it may also receive a branch from the sympathetic and a twig from the *ansa hypoglossi*, but this latter communication, as Henle[a] justly remarks, is more probably derived from the spinal than the hypoglossal factor of the loop; in fact the account given by Schwalbe[b] leaves no doubt that the *ansa* is formed entirely by spinal nerves. The latter anatomist also states that the communication of the *ansa* with the phrenic is rare, and consists of fibres derived from the third cervical nerve.[c] Henle also testifies to the rarity of this communication. I have only met with it once; I have frequently seen communicating branches from the sympathetic both in the lower part of the neck and close to origin of the phrenic from the fourth, but I have only taken statistical notes of the roots which the phrenic derives directly from the cervical nerves, and of the communicating twig that it receives from the nerve to the subclavius. I shall, therefore, only quote the literature of this part of the subject.

Gray[d] describes the phrenic as arising "from the third and fourth cervical nerves and receiving a communication from the fifth or sometimes from the fifth and sixth." The nerve to subclavius "arises from the fifth cervical at the point of junction with the sixth," and is "usually connected by a filament with the phrenic nerve." Ellis'[e] account agrees with Quain's. Cunningham's description is substantially the same; with regard to the nerve to the subclavius he says:—"A communication between this nerve and the phrenic is by no means uncommon. This connecting filament may join the phrenic in the neck, or it may even enter the chest for this purpose. In all probability it represents that communicating twig (or at least a portion of it) which on other occasions passes directly from the fifth cervical nerve to the phrenic."[f] The same author has described an accessory phrenic

---

[a] Handbuch der Nervenlehre des Menschen, 2nd edition, 1879, p. 522.
[b] Lehrbuch der Neurologie, 1881, pp. 887, 888.
[c] P. 888.
[d] Gray's Anatomy, eleventh edition, 1887, pp. 682, 684.
[e] Demonstrations of Anatomy, ninth edition, 1882, pp. 72, 73.
[f] The Dissector's Guide, Part III., 1887, p. 127.

derived from the fifth cervical and passing into the thorax independently of the main phrenic, which it joined in the upper part of the thoracic cavity.[a] Turner has described a similar case,[b] and also gives the result of an investigation of the nerve to the subclavius, which shows that the communication, "most frequently a small branch, ran almost transversely to join the phrenic before that nerve entered the thorax." In one remarkable case described in the same paper the communicating branch from the nerve to the subclavius ran a separate course through the thorax and "joined the phrenic nerve immediately above the diaphragm." [c]

Henle, Krause,[d] and Schwalbe give a very similar account to the British anatomists, but are rather more dogmatic. The two former agree that the nerve to the subclavius is derived from the fifth alone; the latter says it arises from the trunk formed by the fifth and sixth. Krause and Schwalbe mention an occasional root from the sixth (separate from the nerve to the subclavius). These anatomists all agree that the root from the third is the commonest accessory root of the phrenic; Luschka,[e] however, gives the following record of the origin of the phrenic nerve in thirty-two carefully observed cases :—

From the 4th cervical only -	12 cases -	37·5	per cent.
From 4th and 5th - -	5 ,, -	15·625	,,
From 4th and 5th, with an additional root from a part of the brachial plexus through which the fibres could not be traced -	2 ,, -	6·25	,,
From 3rd, 4th and 5th -	7 ,, -	21·875	,,
From 3rd and 4th - -	6 ,, -	18·75	,,

[a] Journ. of Anat. and Phys., Vol. VII., p. 95.
[b] Ibid., Vol. VI., p. 102.
[c] Ibid., Vol. VIII., p. 298.
[d] Handbuch der Menschlichen Anatomie, 1879.
[e] Der Nervus Phrenicus des Menschen. Tübingen. 1853, p. 12. For the opportunity of consulting this important paper, as well as several other anatomical papers which I could not obtain in any of the Dublin libraries, I am indebted to the kindness of Professor D. J. Cunningham.

This would give 43·75 per cent. in which a root from the fifth was present, and 40·625 per cent. having a root from the third.

During two winter and two summer sessions I have taken every opportunity of examining the condition of the phrenic nerve in the dissecting-room of Trinity College, and have been able to observe one or both sides of at least 140 subjects during that time. Out of this large number I have been able only to collect sixteen[a] cases upon which I could set statistical value, as I recorded only those cases which came under my observation before the parts had been disturbed, so as to enable me to perform the entire dissection myself. I may be permitted to state, however, that the results obtained from these sixteen specially dissected cases agree in a general way with my more extended observations. The following table gives the results obtained :—

With an accessory root from third[b] - 3 cases - 19 per cent.
With an accessory root from fifth - 12 ,, - 75 ,,
From fourth only - - - - 4 ,, - 25 ,,

These results differ widely from those obtained from Luschka's figures ; the following quotation, however, will show that, in all probability, the nerve to the subclavius was not systematically examined by Luschka, and therefore only roots derived *directly* from the fifth cervical nerve were considered in his statistics. Speaking of roots of the phrenic nerve which take a " very peculiar course " (von höchst eigenthümlichem Verlaufe), he says :— " In one case a branch arose from the brachial plexus, at a distance of half an inch from the subclavian artery, which forthwith divided into two twigs ; the shorter twig proceeded to the upper border of

[a] At the time that I read this paper before the Academy I gave the results of the examination of eighteen subjects, but (as mentioned at the time) the nerve to the subclavius had not been noted in four of these cases. As an additional root may have reached the phrenic through the nerve to the subclavius in these four instances, I have rejected them as untrustworthy, and have added two cases which I have since observed.

[b] In these three cases there were three roots present, from the third, fourth, and fifth cervical nerves. The cases from which this table is compiled were taken from the right sides of nine subjects, and from the left sides of seven others.

the subclavius muscle, and, piercing the latter about its centre, entered the muscular substance. The other twig passed over the subclavian vein, lay immediately under the origin of the internal mammary artery, passed closely applied to the pleura between that membrane and the first rib, and, having divided into two filaments, joined the trunk of the phrenic nerve within the thoracic cavity behind the manubrium sterni" (p. 14). With the exception of the terminal division into two filaments, this does not appear to me to be a "very peculiar course" but the ordinary distribution of the nerve to the subclavius. Moreover, in the preceding paragraph, in which Luschka discusses the origin of the phrenic from the fourth and fifth cervical nerves, he makes no mention of the nerve to the subclavius. Out of the twelve cases given in my table, in which a root from the fifth was present, only seven received a root *directly* from the fifth; this would give 44 per cent., which tallies almost exactly with Luschka's figures. It appears, therefore, contrary to the opinion of most of the German anatomists, that the commonest accessory root is derived from the fifth cervical nerve.

With regard to the root from the third cervical nerve, my results (19 per cent.) differ widely from Luschka's (40·625 per cent.); Luschka, however, explains that in some cases the root from the third passed through the *ansa hypoglossi* and joined the phrenic nerve within the thoracic cavity (*op. cit.*, p. 13), and he figures this arrangement on the left side of a child (*Erste Tafel*). As above mentioned, I have only once seen this communication, and, as it occurred in a subject in which the upper part of the phrenic nerve had been disturbed by dissection, it is not included in my table.

In the Plate which accompanies this paper the chief varieties are shown, and may be tabulated as follows :—

(A) By 3 roots from the third, fourth, and fifth (Fig. 1).
(B) By 2 or more roots from the fourth and fifth.
   (*a*) Nerve to subclavius from fifth :—
      (*a*) With a root to phrenic direct from fifth (Fig. 2).

(β) With root from fifth through nerve to subclavius ;

(1) With part of fourth joining fifth (Fig. 3).

(2) No part of fourth joining fifth (Fig. 4).

(b) Nerve to subclavius derived from fourth, root to phrenic derived from fifth directly (Fig. 5).

(C) Phrenic derived from fourth only—

(a) By two roots, one direct and the other through nerve to subclavius (Fig. 6).

(b) One root only, nerve to subclavius appearing as a branch of phrenic (Fig. 7).

In one case (Fig. 1) the root from the third was very large, and joined the main phrenic at the inlet of the thorax ; in the other two cases it was minute, and joined the phrenic above the level of the fifth nerve. The root from the fourth passed down in one case in two separate fasciculi which united in the thorax. The twig from the nerve to the subclavius usually joined the phrenic in the upper part of the thorax ; in only one instance it united in the neck. The communication from the fourth to the fifth cervical was present 11 times out of the 16 ; in all but one of these cases (Fig. 6) it was more or less adherent to the main root of the phrenic. Its course could be followed through the fifth nerve with a little dissection, especially if it was moistened with a few drops of water, and its destination was found to be various ; in two cases (Figs. 5 and 6) it merely passed among the fibres of the fifth without breaking up in any way, and became the nerve to the subclavius, which in these cases did not derive any fibres from the fifth ; in another case I traced it into the suprascapular nerve. In one case the converse condition of a communication from the fifth to the fourth occurred, the fasciculus from the fifth passing into the superficial descending nerves of the cervical plexus (Fig. 4). I have never seen any fibres derived from the sixth nerve in the nerve to the subclavius. Its apparent origin is either from the fifth or from the commencement of the trunk formed by the fifth and sixth, according to the amount of adhesion present, but if its fibres are traced upwards it will be found to arise entirely from the fifth or fourth. I do not think that this nerve has been pre-

viously seen to arise from the fourth; in the case from which Fig.
7 was taken its origin could be seen without special dissection, as
it was a branch of the phrenic, and the latter nerve arose entirely
from the fourth, and was not in any way adherent to the fifth
cervical nerve.

The communicating twig from the nerve to the subclavius is, I
have reason to believe, much more frequent than is usually sup-
posed. I have seldom seen it absent except in cases in which the
parts had been previously disturbed. My observations differ from
those of Sir W. Turner (quoted above) in regard to the point at
which the communication joins the main phrenic, which I find to
be most frequently in the upper part of the thoracic cavity instead
of in the neck.

I was led to take notes on the nerve to the serratus magnus by
an observation in Henle's "Anatomie," that the root from the
seventh was not constant. In forty-five cases I found three roots,
from the fifth, sixth, and seventh cervical nerves, present forty
times; in one case four roots from the lower four cervical nerves
were present; in the remaining four cases only two roots from the
fifth and sixth nerves occurred. Schwalbe[a] says that this nerve
"ordinarily arises by two roots from the fifth and sixth cervical
nerves," but "not unfrequently receives a third root from the
seventh cervical nerve."

According to my own observation, the following is the usual
arrangement :—The two upper roots unite either within the sub-
stance of the scalenus medius or close to its outer border in a more
or less plexiform manner, usually giving off twigs to the upper
part of the serratus magnus before they unite (Fig. 8). The
upper root is almost invariably associated with the nerve to the
rhomboids. The root from the seventh invariably passes in front
of the scalenus medius without piercing it,[b] and runs downwards

[a] Op. cit., p. 918.

[b] Henle has also noted this point ; he describes the origin of this nerve as
follows, (op. cit., p. 530) :—"Setzt sich in der Regel aus drei feinen Aesten
zusammen, die aus der ersten und zweiten, seltener aus der dritten Wurzel des
Plexus brachialis entspringen und durch den M. scalenus medius lateralwärts
absteigen, von denen der unterste auch wohl *vor* diesem Muskel vorübergeht."

on the serratus for some distance before it joins the main nerve. The rhomboid nerve usually passes in a plexiform manner through the lower part of the levator anguli scapulæ; two or three slender roots commonly pass through the muscle, and one, rather stronger, below it; a twig is not unfrequently furnished to the upper digitation of the serratus magnus (see Fig. 8), after which the twigs unite to form one or two trunks which supply the rhomboids. I have seen as many as five roots piercing the levator scapulæ, and one passing below it, and the six roots then joining to form the nerve. The lowest digitation of the levator is usually supplied by this nerve, but I have also seen it supplying the two lower slips. At a meeting of the Sub-Section of Anatomy and Physiology, held May 7th, 1885, Professor Cunningham called attention to the fact that the typical supply of the levator anguli scapulæ is by twigs from the second, third, fourth, and fifth cervical nerves (the latter through the nerve to the rhomboids); thus each division of the muscle has its own nerve-supply, and the series is carried onwards by the nerve of Bell. He also pointed out that the continuity of nerve-supply is a vestige of the condition found in many of the mammalia, in which the levator scapulæ arises from all the cervical vertebræ and forms one muscle with the serratus magnus. The twig, which I have described above, from the eighth cervical to the nerve to the serratus magnus, shows a further continuation of this series downwards, and, in this connection, it may not be out of place to mention that I have found the levator arising by six slips from the transverse processes of the six upper cervical vertebræ, and, in three other cases, I have seen five slips instead of the usual four.

The plexiform condition of the rhomboid nerve above described appears to have escaped the notice of anatomists. I think it should be pointed out in the text-books, as the appearance of a number of fine twigs where he expects to find one well-defined nerve, is confusing to the junior dissector.

In one subject I met with a twig from the ulnar nerve to the upper and inner part of the flexor sublimis digitorum. This is a very rare variety; a case has been recorded by Turner (" Natural
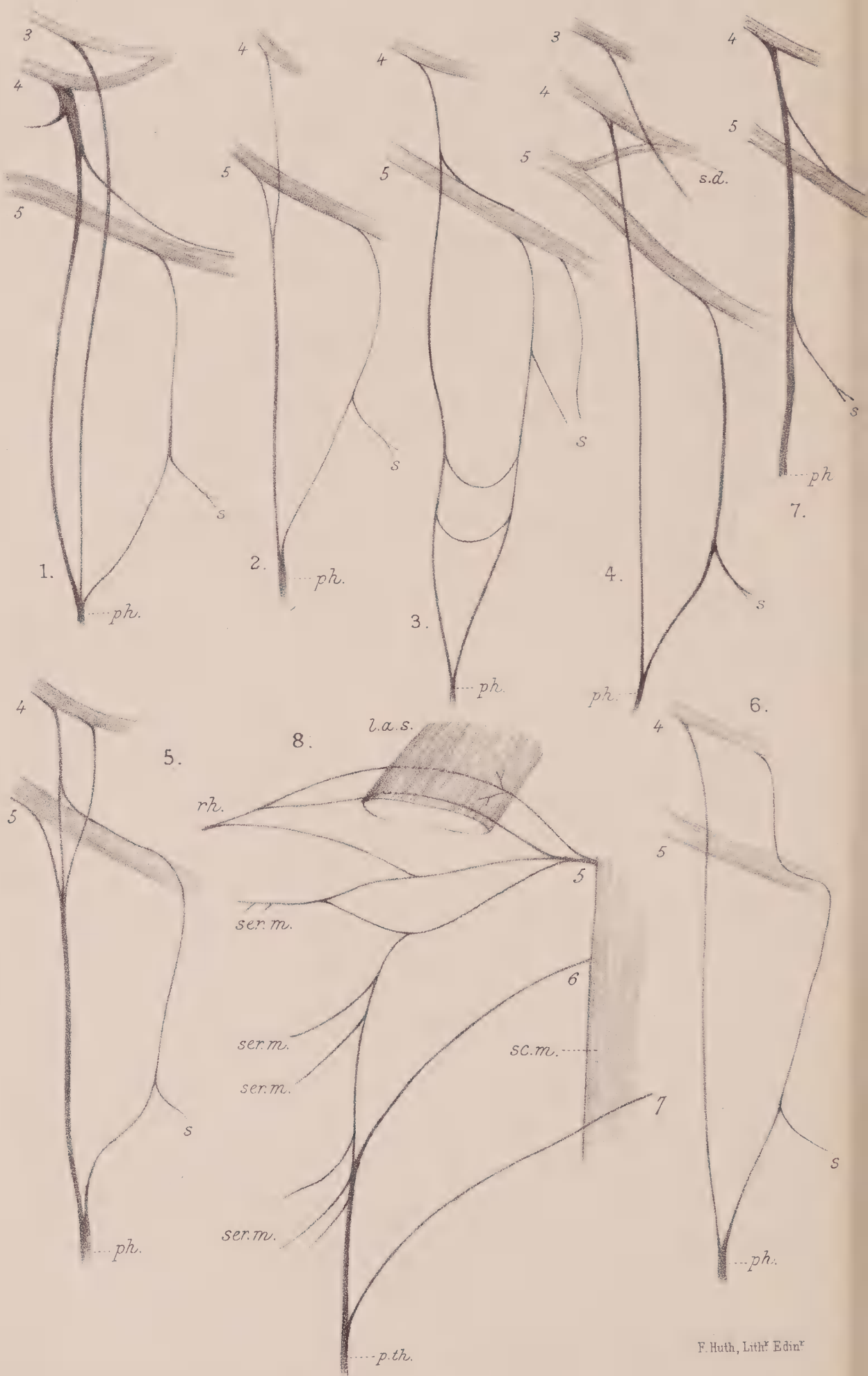
Dr. H. Brooks on variations in the origin of the phrenic nerve.

History Review," 1864). It is interesting as a vestige of the former close union of the flexor sublimis digitorum with the profundus, which is seen in many of the lower mammalia—as, for instance, in the Virginian opossum.

EXPLANATION OF PLATE.

Figs. 1 to 7 show variations in mode of origin of the phrenic nerve, and are explained in the text ; 3, 4, 5, third, fourth, and fifth cervical nerves ; *s.*, nerve to subclavius ; *ph.*, phrenic nerve ; *sd.*, superficial descending nerves of cervical plexus. Note the double nerve to the subclavius in Fig. 3 ; also the curious loops of communication (nerves without ends) it forms with the phrenic (in the neck) before uniting with it lower down (in the thorax). Figs. 4, 6, and 7 are taken from the left side. Figs. 1, 2, 3, and 5 are from the right, but are reversed to compare them more easily with the left.

Fig. 8 shows a frequent condition of the nerve to the rhomboids and nerve to the serratus magnus—it is viewed from in front ; 5, common root of rhomboid nerve and nerve to serratus from fifth cervical nerve ; 6, 7, roots of nerve to serratus from sixth and seventh nerves ; *sc. m.*, scalenus medius ; *l. a. s.*, portion of levator anguli scapulæ ; *rh.*, nerve to rhomboids ; *ser. m.*, twigs to upper part of serratus magnus muscle ; *p. th.*, posterior thoracic nerve.

INDEX.