VOLUME 45 1976 No. 2

THE ULSTER MEDICAL JOURNAL

PUBLISHED BY
THE ULSTER MEDICAL SOCIETY

CONTENTS

	Page
The Ulster Medical Society. Quo Vadis? D. A. D. Montgomery	1
The First Three Professors of Surgery. Ian Fraser	12
The Medical Library. J. H. Millar	47
Prescribing in Northern Ireland. P. C. Elmes, Helen Hood and O. L. Wade	56
Clomiphene and Neural Tube Defects. N. C. Nevin and J. M. G. Harley	59
Glucagon: Its Significance in Health and Disease. Elisabeth R. Trimble	65
Psychiatry at a Mission Hospital in South Africa. J. Crane	73
Psoriatic Clearance During Haemodialysis. J. McEvoy and Agnese M. T. Kelly	76
Serum Creatine Phosphokinase in the Detection of Carriers of Duchenne's Muscular Dystrophy in Northern Ireland. D. McCormick and Ingrid V. Allen	79
Active Chronic Hepatitis: Part I. T. Fulton and V. J. McCann	84
Book Reviews	99
The Foundation of the "Inst" Medical Department and its Association with the Belfast Fever Hospital. P. Froggatt	107
The Legacy of Richard Burdon Haldane. O. L. Wade	146
Pro Tanto Quid Retribuamus. H. Logan	157
Prescribing in Northern Ireland: Sleeping Tablets. P. C. Elmes, Helen Hood, Carol McMeekin and O. L. Wade	166
Symptoms of Non-Toxic Nodular Goitre. S. H. Armistead	178
Sclerosing Peritonitis Due to Practolol Simulating an Ovarian Tumour. J. M. Dunlop and H. Logan	181
The Present Status of Vagotomy. T. Kennedy	183
Acute Septic Arthritis in Children. R. A. B. Mollan	189
Active Chronic Hepatitis: Part II. T. Fulton and V. J. McCann	195
Perforated Peptic Ulcer and the Civil Disturbances in Belfast 1967 - 74. S. A. Compton, N. K. Cooper, R. J. Clyde, J. S. A. Collins and Catherine M. Friel	205
Maternal Infant and Social Factors Associated with Birthweight. K. W. Harper	210
Book Reviews.	216

CONTENTS

Page

THE FOUNDATION OF THE "INST" MEDICAL DEPARTMENT AND ITS ASSOCIATION WITH THE BELFAST FEVER HOSPITAL. P. Froggatt - 107

THE LEGACY OF RICHARD BURDON HALDANE. O. L. Wade - - - 146

PRO TANTO QUID RETRIBUAMUS. H. Logan - - - - - 157

PRESCRIBING IN NORTHERN IRELAND: SLEEPING TABLETS. P. C. Elmes, Helen Hood, Carol McMeekin and O. L. Wade - - - - 166

SYMPTOMS OF NON-TOXIC NODULAR GOITRE. S. H. Armistead - - 178

SCLEROSING PERITONITIS DUE TO PRACTOLOL SIMULATING AN OVARIAN TUMOUR. J. M. Dunlop and H. Logan - - - - - 181

THE PRESENT STATUS OF VAGOTOMY. T. Kennedy - - - - 183

ACUTE SEPTIC ARTHRITIS IN CHILDREN. R. A. B. Mollan - - - 189

ACTIVE CHRONIC HEPATITIS: PART II. T. Fulton and V. J. McCann - 195

PERFORATED PEPTIC ULCER AND THE CIVIL DISTURBANCES IN BELFAST 1967 - 74. S. A. Compton, N. K. Cooper, R. J. Clyde, J. S. A. Collins and Catherine M. Friel - - - - - - - - 205

MATERNAL INFANT AND SOCIAL FACTORS ASSOCIATED WITH BIRTHWEIGHT. K. W. Harper - - - - - - - - - 210

BOOK REVIEWS. - - - - - - - - - 216

Fellows and Members of the Ulster Medical Society receive the Journal Free. Details as to subscriptions on back page.

This publication is available in microfilm from Xerox University Microfilms, 300 North Zeeb Road, Ann Arbor, Michigan 48106

THE ULSTER MEDICAL JOURNAL

NOTICE TO CONTRIBUTORS

1. Authors are reminded that concise and clearly expressed papers are those most welcomed by readers and by the Editorial Board.

2. Manuscripts should be typewritten with double spacing and with wide margins. They should be fully corrected, and contributors will be responsible for the payment of any sum charged for alterations in printer's proof.

3. References should be restricted to those really necessary and useful and cited in the text with the author's name(s) and date. References arranged alphabetically should give the author's name(s) and the year. This should be followed by the title of the paper, the full title of the journal, the volume and page number, and for books the title, the town of publication and the publisher. By arrangement special articles may cite by superior numerals.

4. Scientific measurements should be given in SI units, but blood pressure should be expressed in mmHg and haemoglobin as g/dl. Traditional units may usefully be given in parenthesis and conversion factors may be stated, especially with tables and illustrations.

5. Tables must ke kept simple and should avoid vertical rules. They and illustrations must be kept to a minimum and data should not be given in both text and tables. Line drawings should be used whenever possible. All illustrations must be in a form ready for publication. Authors may be charged for all blocks at cost prices.

6. Orders for reprints must be given when the author returns the printer's proof. The cost of these may be obtained from the printers in advance.

7. Editorial communications should be sent direct to the Editors. The Editors will be glad to advise authors on the preparation of their manuscripts.

ADVERTISEMENTS

Enquiries about advertising space should be directed to:

Mr. Ernest J. McConville,
The Stables, Tudor Park, Holywood.
Telephone: Holywood 2918.

DATES OF PUBLICATION

It is hoped to issue a Winter and Summer Number each year in February and September.

THE ULSTER MEDICAL SOCIETY

P.O. Box 222,
Belfast City Hospital,
Belfast 9.

If you are not a member of the Ulster Medical Society, we would appeal to you to give the question of joining your consideration. The Society has been in existence since 1862 (and is the direct descendant of the Belfast Medical Society founded in 1806), and has always been active in keeping its members interested in the advances in medical science. Meetings are held at intervals of a fortnight during the winter months, and papers are contributed by members and distinguished guests. Facilities are provided for doctors to meet informally afterwards and have a cup of tea. *The Ulster Medical Journal, the official organ of the Society, is issued to all Fellows and Members free of charge.* The Society is now rehoused in its own Rooms in the new Whitla Medical Building of Queen's University at 97 Lisburn Road, and this replaces the Whitla Medical Institute which had to be vacated in 1965.

May we, therefore, appeal to you to join the Ulster Medical Society, and so enable us to widen its influence and sphere of usefulness still further? A proposal form is appended: your proposer and seconder must be Fellows of the Society. If you do not know any Fellows please contact the Honorary Secretary. All persons registered as medical practitioners under the Medical Acts shall be eligible for election as members of the Society (Constitution, Section VI). Temporary membership may be allowed at the discretion of the Council.

If you do not wish to become a member of the Society, will you consider entering your name as a subscriber to THE ULSTER MEDICAL JOURNAL? The subscription is £2.00 per annum, payable in advance to the Honorary Treasurer.

D. A. D. MONTGOMERY, *President.*
D. R. HADDEN, *Hon. Secretary.*
J. D. BIGGART, *Hon. Treasurer.*

MEMBERS **£3.00.** (A Member is one who is less than seven years qualified. He or she will automatically become a Fellow seven years after qualification and be liable to the higher subscription rate.)

FELLOWS—1 (a) Annual subscription of Fellows resident, practising or holding an appointment within ten miles of Belfast, **£5.00;** (b) husbands and wives in the above category who are both Fellows will be entitled to pay a combined subscription of **£7.50;** 2 (a) annual subscription of Fellows resident, practising or holding an appointment outside the above area, **£4.00;** (b) husbands and wives in the above category who are both Fellows will be entitled to pay a combined subscription of **£6.00;** 3, annual subscription of retired Fellows, provided that any Fellow who, by reason of retirement either through age or illness, is no longer engaged either in private practice or in salaried employment, shall be entitled, *on application,* to pay an annual subscription of **£3.00;** only, and provided always that such Fellow has previously paid to the Society a subscription at the current rate for an uninterrupted period of at least ten years, or during such time has been in practice or service abroad.

All Fellows and Members of the Society who have paid subscriptions for 40 years or alternatively having been a Fellow or Member for 20 years and reached the age of 65, or more, shall be exempt from any further subscription.

LIFE MEMBERSHIP—Fellows and Members shall be eligible to become Life Members, **£75.00.**

To DR. J. D. BIGGART,
THE LABORATORIES,
BELFAST CITY HOSPITAL,
BELFAST BT9 7AD.

.....19.....

Dear Sir,

We nominate for $\frac{\textit{Membership}}{\textit{Fellowship}}$ *of the Ulster Medical Society—*

Name of Candidate .....

Postal Address .....

.....

Year of Qualification and Degrees .....

.....

Signature of Proposer .....

Signature of Seconder .....

EXCHANGES: Exchange journals and all relevant correspondence should be addressed to:
QUEEN'S UNIVERSITY MEDICAL LIBRARY,
INSTITUTE OF CLINICAL SCIENCE,
GROSVENOR ROAD, BELFAST BT12 6BJ,
NORTHERN IRELAND.

BOOKSELLERS: All correspondence, orders and payments for institutional and private subscribers, through booksellers, should be sent to:
THE HONORARY TREASURER,
ULSTER MEDICAL JOURNAL,
c/o QUEEN'S UNIVERSITY MEDICAL LIBRARY,
INSTITUTE OF CLINICAL SCIENCE,
GROSVENOR ROAD, BELFAST BT12 6BJ.
NORTHERN IRELAND.

SUBSCRIPTIONS: Individuals who are not members of the Society wishing to take out a direct subscription should send a banker's order for £2.00 payable to the Ulster Medical Society (Northern Bank, Shaftesbury Square, Belfast), Ulster Medical Journal Account, to Dr. J. D. Biggart, The Laboratories, Belfast City Hospital, Belfast BT9 7AD. This covers one volume (two numbers) of the Journal.

CONTENTS

Page

THE FOUNDATION OF THE "INST" MEDICAL DEPARTMENT AND ITS ASSOCIATION WITH THE BELFAST FEVER HOSPITAL. P. Froggatt - 107

THE LEGACY OF RICHARD BURDON HALDANE. O. L. Wade - - - 146

PRO TANTO QUID RETRIBUAMUS. H. Logan - - - - - 157

PRESCRIBING IN NORTHERN IRELAND: SLEEPING TABLETS. P. C. Elmes, Helen Hood, Carol McMeekin and O. L. Wade - - - - 166

SYMPTOMS OF NON-TOXIC NODULAR GOITRE. S. H. Armistead - - 178

SCLEROSING PERITONITIS DUE TO PRACTOLOL SIMULATING AN OVARIAN TUMOUR. J. M. Dunlop and H. Logan - - - - - 181

THE PRESENT STATUS OF VAGOTOMY. T. Kennedy - - - - 183

ACUTE SEPTIC ARTHRITIS IN CHILDREN. R. A. B. Mollan - - - 189

ACTIVE CHRONIC HEPATITIS: PART II. T. Fulton and V. J. McCann - 195

PERFORATED PEPTIC ULCER AND THE CIVIL DISTURBANCES IN BELFAST 1967 - 74. S. A. Compton, N. K. Cooper, R. J. Clyde, J. S. A. Collins and Catherine M. Friel - - - - - - - - 205

MATERNAL INFANT AND SOCIAL FACTORS ASSOCIATED WITH BIRTHWEIGHT. K. W. Harper - - - - - - - - - 210

BOOK REVIEWS. - - - - - - - - - 216

Fellows and Members of the Ulster Medical Society receive the Journal Free. Details as to subscriptions on back page.

This publication is available in microfilm from Xerox University Microfilms, 300 North Zeeb Road, Ann Arbor, Michigan 48106

THE
ULSTER MEDICAL JOURNAL

PUBLISHED ON BEHALF OF THE ULSTER MEDICAL SOCIETY

VOLUME 45 1976 No. 2

THE FOUNDATION OF THE "INST" MEDICAL DEPARTMENT AND ITS ASSOCIATION WITH THE BELFAST FEVER HOSPITAL

by

PETER FROGGATT, M.D., Ph.D., F.R.C.P.I., M.R.C.P., F.F.C.M., D.P.H.
Formerly Dean of the Faculty of Medicine. Vice-Chancellor of Queen's University, Belfast

PREAMBLE

THE Merrison Report[1] was published in April 1975. Its recommendations, if adopted, could affect the relationship between university and hospital. It proposes *inter alia* an extension of the *postgraduate* responsibility of the licensing bodies from their present mainly nominal control of the pre-registration year to an active role in a possibly two-year postgraduate period ("graduate clinical training"): they will then have statutory duties in *all* medical education up to the first part of a Royal College diploma (MRCP, FRCS, etc) —an historically unique situation.

This extension of authority may not be accompanied easily or amicably: reserves of goodwill may become exhausted. Previous incursions by the university have been resented, sometimes resisted: the clinical demands of the professorial units; specialist facilities for designated (specialist) lecturers; university control of what is frequently seen as an "apprenticeship" pre-registration year. Teaching of students in hospital is as old as hospitals themselves, but the consequential university presence has not always been welcomed. Certain of the Merrison proposals will be unpopular with hospital staff and the prudent dean should first prepare the ground by putting the university/hospital relationship in its historic setting.

This article describes the first efforts in Belfast to establish a comprehensive medical course shared between college (Belfast Academical Institution; "Royal" from 1831) and hospital (the Fever Hospital, Frederick Street; from 1847 called the Belfast General Hospital). It identifies differences in their separate approaches but also the essential unity of purpose and cohesion of the profession which were ultimately transcendent. The author hopes that this story has lessons for today.

College and Hospital

The College

The Belfast Academical Institution (termed below "Inst" or "the college") was conceived at a meeting on 6 June 1806, planned at a public meeting on 1 August 1807, established at a general meeting of subscribers on 4 February 1808[2], incorporated by statute in 1810[3], and opened on 1 February 1814 for school pupils and later for college students[4, 5]. Its object was: "To diffuse as widely as possible through the province and population of Ulster, the benefits of Education, both useful and liberal; and by that means, to prevent the hard and disgraceful necessity, in such a great and prosperous community, of sending their children to seek in other countries, with much risk to their health and morals, for that instruction . . . which might be equally well attained at home"[6]. Particularly, it was to provide cheap education from school to college level free from religious test (unlike Maynooth) or denominational favour (unlike Trinity College, Dublin)* and appropriate to the liberal spirit of the late 18th century, to the principle that all students should receive their secular education in common, and to the economy and needs of Ulster. There were two departments, "college" and "primary": the latter had "schools" of english, classics, mathematics, french, writing and drawing, with others added as numbers grew; the former was a university of the Scottish type in embryo, with professors in mathematics; logic, *belles lettres* and rhetoric; moral philosophy; latin and greek; hebrew; natural philosophy and chemistry; anatomy and physiology; and two in divinity and church history. As well as lectures for the general certificate there were "popular lectures upon those subjects which are most conducive to the improvement of the Agriculture, Arts, and Manufacture of the country . . . [with] a Library and Museum for fossils, models of useful instruments and machines and engines . . . and natural curiosities"[2]. The *board of managers* was drawn from the subscribers; inspection and ancillary duties were by a *board of visitors* of subscribers and distinguished local citizens; and the *joint board of managers and visitors* (termed below "the joint boards") had wide powers under the *court of proprietors* (the governing body) and was the *de facto* authority.

The primary department opened on 1 February 1814 with 11 boys enrolled in the writing class**; the college lectures started on 1 November 1815 with 80 subject enrolments either for the three-year general certificate (recognised by the presbyterian synods in Ulster as equivalent to the MA degree of a Scottish university) or simply to acquire knowledge.*** (see footnote page 109).

The founders intended to establish a medical school within the college; delay was due to the "inability to endow the necessary Professorships"[8]. On 6 October

---

* Maynooth was founded by act of parliament (35 Geo. III, cap. 21) in 1795 exclusively for professing roman catholics; Trinity College was "liberalised" in 1794 but still the provost and fellows, and all scholarship holders, had to be anglican. Furthermore, many of the courses were inappropriate for the needs of the Ulster community.

** I have compiled this from the School Album 1814–1876 (SCH 524/1A/1). Jamieson says there were 255 boys enrolled by 1 May 1814 (*Jamieson, op. cit*, p. 21).

1818 James Lawson Drummond MD, attending physician at the Fever Hospital and medical attendant to its dispensary since 1814 (the year he obtained his Edinburgh MD for a thesis "De Oculi Anatomia Comparativa"[9]) wrote to the joint boards offering to start lectures without salary in anatomy and physiology[10]. A chair in "anatomy and medical physiology" was created almost immediately (after Drummond had withdrawn his offer) with a salary of £50 p.a.[11], and on 15 December he was unanimously elected in preference to the only other candidate, Mr. John Sewell[12]. There being no faculty of medicine Drummond's chair was in the faculty of arts, and from 1 November 1819 he taught "a very wide field of natural history and a good deal of natural theology: there is scarcely a fact in Paley's Natural Theology that is not explained and illustrated . . . [also] a little human dissection"[13] to classes varying from five (in 1822–23)[14] to 26 (in 1828–29)[15], some preparing for the presbyterian ministry—for which "I think [the classes] must be of great importance"—but also "to a number of medical men, apothecaries, apprentices and others"[13]. Accommodation was cramped: Drummond shared a room in rotation with four other teachers, had no dissection room and only a small communal museum, and made his preparations in the porter's lodge after moving bedsteads for boarding pupils to the white linen hall[16].

Withdrawal in 1816 of the £1,500 p.a. government grant because of seditious toasts drunk at a St. Patrick's day dinner in Gillet's Hotel at which three visitors, two managers, and two masters were present, postponed immediate moves towards creation of the medical faculty: no new initiative was taken until 1826 (when the grant was expected to be renewed) although the resourceful Drummond extended his science-based lectures to include (from 6 March 1822) a popular course in botany at which as many as 50 students attended, paying 10/- each[17], and arranged for William Knight, professor of natural philosophy, to give evening courses in the "elements of chemical science"[18].

The Hospital

The *News-Letter* for 6–10 April 1792 carried a notice for a public dispensary, to include a "humane society", for the relief of the "sick poor of all descriptions whether strangers or natives", the Belfast Charitable Society's poorhouse (founded in 1776) designed to hold fifty paupers and ten destitute sick being inadequate for the medical needs of the rapidly growing community[19, 20]. Resolutions passed on 19 April by the founders consequent on the issue of the general prospectus of 13 April, included "a scheme for the relief of sick poor of all descriptions; a scheme for the promoting of the practice of inoculation; a scheme for the recovery of persons drowned and apparently dead [this was the "humane society" part and reflects the interest of the guiding spirit, James McDonnell, whose thesis

*** One such student was Gavan Duffy who enrolled in the department of logic and belles-lettres for the 1841–2 session[7]. The 80 enrolments were: mathematics, 18; logic, 24; moral philosophy, 14; and divinity, 24, all listed under the "Associated Synod of Seceders of Ulster". There were none listed under the Synod of Ulster (SCH 524/7B/13/41).

for the Edinburgh MD was entitled "On the Drowned"]; and a scheme for the relief of lying-in-women"[21]. Office-bearers were elected (on 16 May) and during the next 19 months 733 patients were treated. After a period of "total want of interest" the growing prevalence of fever stirred public apathy, a subscription list was opened, the dispensary moved from the Society's poorhouse to a rented house in Factory Row (now Berry Street), and in April 1797 the hospital opened with six beds, a nurse, and a fund of £58. In October 1799 it moved to three houses in West Street on a lease to expire in 1810. By act of parliament of 1807[22] grand juries were empowered to give limited aid to "fever hospitals" (£100 at each assize) and expansion, security, and larger premises were assured. In 1810 land was leased in Frederick Street from Lord Donegall, and the foundation stone (including various articles emblematic of the times) of a new 100-bed hospital to Lanyon's design was laid on 5 June 1815. A general dispensary was associated with the hospital, the town being divided into six districts each with a medical attendant, serving gratuitously, who saw "sick-poor" in the area "considered and recommended by any [hospital] subscriber as objects requiring aid from the dispensary"[23]. The hospital staff were appointed annually and were ordinarily drawn from the dispensary physicians. Over the first few years an annual average of up to some 1,200 patients were admitted and 10,000 prescriptions issued[24].

The foundation stone was engraved with an inscription in latin which started "Hoc Nosocomium aegrotis et arti medicae sacrum . . ." ("This hospital dedicated to the sick and to the art of medicine . . .")[25]: the sponsors intended that medicine should be taught as well as patients treated, an objective missing from the 1792 prospectus. This was made explicit in a report by an audit sub-committee of Robert Tennant and Robert McGee of 25 August 1817: ". . . the Physicians and Surgeons of Belfast should be invited to place their pupils [in the hospital] to acquire experience of observing its practice; and in the course of a few years it might become a school of Physic and Surgery of no trifling importance to the young medical students of this neighbourhood and the Province of Ulster . . ."[26]. The staff agreed, pressed the committee for a decision but not until 16 January 1820 did the committee resolve: "first . . . that it is safe and proper to admit pupils into this hospital; and secondly, that each of the Medical Attendants may introduce one pupil approved by the Committee, to see his practice, and to act as clerk or dresser . . . thirdly, the pupil so admitted is prohibited from visiting the patients of any other Physician or Surgeon without his permission . . ."[26]. In 1821 a Mr. William Bingham walked the wards as the first registered student[27]. He was the first of the many: annual enrolments soon reached "eight or ten", stood at 28 in surgery by 1836[28], and by 1850 over 400 students had attended each (from 1824)[29] paying one guinea annually raised (from 1836) to three guineas, and the survivors of death or disinterest sought licenses in Dublin, London, Glasgow or Edinburgh.

The Foundation of the Medical School

Initial Steps, 1826–1829

By the early 1820s the first steps (registered pupils in the hospital; a professor of anatomy and physiology at Inst) had been taken to implement the teaching objectives of both hospital and college: what was now required was (i) a course of clinical lectures, (ii) organised bedside teaching, (iii) collaboration, then rationalisation, between hospital and college with agreed machinery of joint control, leading to (iv) the establishment of chairs in clinical subjects with associated clinical facilities and a medical faculty to organise and run an approved curriculum with an end-course general medical certificate recognised for their examinations by the major licensing bodies. These aims required adequate funding, a supply of pupils, and political will of hospital and college: the first was denied to both Inst and the hospital; the second was not then assured Drummond and the hospital having less than 10 students[15, 28]; and the third was not present to the extent of compromising certain self-interests as we shall see. The result was delay: only in 1826, with the restoration of the Inst grant assured, were the first steps taken.

On 1 November 1826 Drummond wrote to the joint boards of Inst and the committee of the hospital proposing collaboration in creating a "preparatory [non-degree awarding] school of medicine and surgery, useful and important to the medical youth of Ulster"[30]. The letter continued:

> "After Anatomy, the next great objects of medical education are Chemistry and Materia Medica . . . [and then] it is of early importance to the student to have an opportunity of observing disease in its various aspects. . . . I would therefore suggest the utility of a ward in the hospital being appropriated to the reception of a certain number of patients, to be placed under the care of one or two physicians, and that clinical lectures be delivered twice a week on the cases of said patients. . . . A weekly lecture or two on the surgical cases in the hospital by the Surgeons would be of great importance . . . and were medical students entrusted under proper relations with . . . cases in the [lying-in] hospital it would form to such students a most valuable source of improvement. . . . Though we are not to look on the privilege of conferring medical degrees . . . I . . . hope that a time may come when a session or two spent here will be considered equivalent to an equal time spent in Edinburgh or Dublin"[30].

Drummond was here advocating one coherent syllabus containing pre-clinical and para-clinical courses (at Inst) and organised clinical teaching in medicine, surgery, and obstetrics (at the hospital) on the lines of Edinburgh, Glasgow, and Trinity College, Dublin[31].

This initiative was carefully timed. From the arrival of the first hospital pupil in 1821 the staff were keen to increase the student numbers and develop teaching: students were "very useful to the surgeons as dressers" and the staff hoped that they "will particularly increase, and the Hospital and Dispensary

may become the foundation of a School of Physic"[32]. Drummond also knew that the Commissioners—who took evidence on Inst at the Royal Hotel, Belfast, mainly during October 1825—would probably recommend restoring the government grant (discontinued since 1816) as indeed they did three months later on 28 January 1827[33]. Furthermore, comprehensive provincial schools of medicine outside the universities were being founded in Britain to supply courses for the curriculum of the Society of Apothecaries subsequent on the Act of 1815[34]. Hospital and college were increasingly turning their attentions towards a Belfast medical school: Drummond was merely catching the tide.

Drummond's letter was noted by the joint boards on 7 November and considered on 12 December 1826[35]; it was not discussed by the medical staff of the hospital until 24 December[36]. The joint boards were uncritically enthusiastic: members would "use every action in their power to carry his [Drummond's] views into effect"[35]. The hospital staff, however, flatly rejected the proposals: they "very properly and on very adequate grounds took objection to the plan . . . but at the same time stated that . . . clinical lectures in the hospital . . . might be undertaken by one or more of the Medical Attendants, in their respective departments, without being liable to the objections to which they referred"[37]. These "objections" were very real to the staff and were spelt out in their report (18 February 1827) to the committee of managment who in turn (4 March) referred it with their full support to the joint boards of Inst.[36]

The staff's objections were threefold: first, they were accountable to the hospital committee and "it is doubtful how far the hospital could be benefitted by a connection with . . . any Public Body other than the Grand Jury of the County by whose presentiments they derive a considerable portion of their annual income"; second, "the establishment . . . of Clinical Lectures in the Hospital under the auspices of the Joint Boards of the Institution and under a Professor of their appointment who would in no degree be responsible to the Committee of the Hospital nor consequently to the Grand Jury does not appear to be an eligible scheme"; and third, Drummond's suggestion to set aside a number of patients for teaching would mean transferring the very few non-fever patients to the "charge of a Physician or Surgeon appointed by a different body who is to be entitled *ex officio* to exercise his function in the Hospital for life [hospital staff appointments were annual] be he who he might"[36]. Instead they proposed a paid clinical lecturer to be appointed from the hospital staff and Drummond's anatomy students should be encouraged to enrol. They supported a joint medical school; indeed they hoped that "this Hospital will become speedily and powerfully subsidiary to these purposes . . . in as much as it holds out these facilities and inducements for the study of Physic and Surgery . . . without which any other attempts at this kind of education must be for ever abortive", and they considered the present initiative timely because the Inst grant was to be restored, pre-clinical lectures were already established, "disposition . . . for a domestic education was growing", and "the different Universities have already sanctioned the growth of minor schools in several other towns by permitting tickets of attendance at Hospitals containing 80 beds or upwards . . . to entitle students to

obtain Degrees or Diplomas"[38]. But they were not going to surrender their autonomy and at the same meeting (4 March) the hospital committee referred back to the staff the question of establishing clinical lectures "by the medical attendants themselves." At the next annual general meeting (8 May) resolution 5 enjoined the hospital committee "to give every encouragement for the delivery of lectures [by a staff member] on select cases in the Medical and Surgical departments, and to facilitate the attendance of pupils at these lectures and on the general practice of this Hospital"[39]: this, not the surrender of facilities to college professors not of their choosing, they considered their proper initial contribution to the joint enterprise. The way was now open and on 3 June the 65-year-old James McDonnell, an attending physician, gave the first clinical lecture at the hospital on the subject "Systematic Medicine"[40] followed during the summer by lectures from Dr. W. M. Wilson (attending physician) and Mr. D. Moore (consulting surgeon)[41] to probably no more than eight or ten students[28].

This series with other clinical instruction was expanded the following summer (no clinical lectures were given during the college session of November to May[42]) by an enthusiastic staff who were even planning further self-denying changes: "Any attempt at the education of youth at an Hospital pre-supposes and ensures a more minute record of each individual case—a more perfect regularity of attendance—and more frequent visits by the Physicians and Surgeons. . . . Some new arrangements are proposed with respect to the Dispensary Districts . . . which . . . may prove useful . . . to the purposes of instruction . . ."[41]. All was enthusiasm and bustle as they prepared for the foundation of the medical school.

At Inst there was enthusiasm but no bustle: in debt for over £1,000, with bank guarantees held by individual managers[43], with government meeting a deputation on 18 May 1827 with a refusal to reconsider the grant renewal until 1828 when it could be "considered . . . with fairness and friendly feeling"[44], and with a public appeal for money just launched[43], no moves were possible. The grant was in fact restored for 1828–29 but subject to terms only agreed with the Lord Lieutenant on 30 December 1828 and not paid until March 1829[45]. Only on 20 October 1829, 29 months after McDonnell's first clinical lecture marked the start of the hospital response to Drummond's 1826 letter, was there a formal move by Inst: the joint boards asked the faculty (of arts) whether a medical school should still be established[46]. The faculty reply was swift and enthusiastic[47]: the 300 medical students from Ulster who studied elsewhere would be kept at home: Inst, the hospital, the profession, and Ulster would benefit; a medical school had always been intended; and the regulations of the Royal College of Surgeons of Edinburgh of July 1829 recognised two sessions at approved schools in eligibility for its examinations[48]. The joint boards immediately agreed on discussions with the hospital staff for a medical school "in the Institution"[47] and hoped that "the facilities afforded by the Hospital for the acquirement of medical knowledge should be rendered available"[49].

Events now moved swiftly. On 15 November the committee and medical staff opened discussions with a deputation from the joint boards[50], and the next day the medical staff resolved ". . . that we will be ready to concur with the Boards

of the Institution in any measures necessary for carrying it [the joint medical school] into effect"[51]. This was noted favourably the following day by the joint boards[51] and by the hospital committee on 29 November who unanimously resolved that they were "ready to co-operate with the Joint Boards . . . in any measures for the attainment of so desirable an object, that may be consistent with the welfare and interests of the Hospital"[52]. The joint boards received this resolution on 1 December and referred the problem of necessary accommodation to a committee[52]. Problems clearly lay ahead but the enthusiasm of both partners was a hopeful augury.

Negotiations, 1830–1831

A declaration of intent is one thing: translation into action another. Money was needed for pre-clinical accommodation and medical staff salaries (the restored government grant was only to pay faculty of arts staff) and despite promptings by the hospital[49] and fund-raising circulars by Inst[53] little could be done. The hospital staff now became impatient and took the initiative in an unusual way. In October 1830, seven medical attendants to either hospital or dispensary—Drs. S. S. Thomson, McDonnell, McCormac, Little, McGee, Murray, and Surgeon McKibbin—with Drummond and Surgeon Wales, formed themselves into a *soi-disant* "Faculty of the Belfast School of Medicine and Surgery" with Thomson as "president", to "form a medical and surgical school in Belfast, that it was their wish to connect it with the Belfast Academical Institution, and that they had arranged the parts that each individual was to take to carry their purpose into effect". Lectures would start on 1 November 1831 "whether the Institution shall approve or not but they would prefer doing it with the approbation of the Institution and in connection with it", and the school would be accommodated in temporary premises but would move to Inst when permanent accommodation was built. The "parts [chairs] that each individual was to take" were: anatomy and physiology—Drummond; chemistry —McCormac; materia medica and pharmacy—Murray; practice of medicine— —McDonnell; theory of medicine—Little; midwifery and diseases of women and children—McGee; principles and practice of surgery—McKibbin; medical botany—Drummond; and Surgeon Wales would be demonstrator in anatomy. Vacancies would be filled by the joint boards on the advice of this "faculty" just as the presbyterian synod advised on the chairs in the faculty of arts*. In short: this "faculty" would nominate the professors of the joint school and advise on their successors; would arrange the lectures and curriculum content; and would supervise the whole enterprise[54]. Drummond's inclusion gave it "joint" credentials and evidences his political awareness.

Faced with this mixture of enthusiasm and self-interest the joint boards wavered: they resolved that the "faculty" should give a full report of its "views,

* The names of candidates for chairs with their testimonials were submitted to the general synod of the presbyterian church and the moderator or his representative made known the synod's preference before the joint boards voted. This had little effect on appointments to medical chairs (see page 122).

intentions, and constitution"[55], and this the "faculty" did in a more conciliatory vein only two days later[56]. Lectures and the curriculum would be "agreeably to University regulations"; examinations would be in Inst; the desire for "permanent union" with Inst was stronger than ever "if it could be accomplished without compromise of principle on either side"; and a joint planning committee should consider the terms of such union. The proposals for professorships, however, must remain. The joint boards were now sufficiently encouraged to appoint a committee of three managers (Robert Tennant, George T. Mitchell and Thomas Ekenhead), two visitors (Edmund Getty and Robert McCluney) and the dean of the faculty of arts (Rev. J. Hanna) as chairman, to negotiate with the hospital committee and to canvas opinion from all the doctors in Belfast: only on the election of professors was this committee mandated—"all elections to any professorships must emanate from themselves [the joint boards of Inst]"[57]. Lines were now drawn on the first serious controversy—appointments.

This Hanna committee met a deputation from the "faculty" (Drummond, McKibbin and McCormac) later in the month. The "faculty" had by now further shifted their position: they would resign their present *soi-disant* and upaid "professorships" and allow them to be filled by Inst on three conditions: (i) that the "faculty" decide the extent of the curriculum ("number of classes"); (ii) that the professors be elected from medical practitioners residing in Belfast; and (iii) that the chairs be permanently tenured[58]. The Hanna committee accepted (i)—Drummond after all was their own professor of anatomy and physiology, and would represent college interests; suggested an initial seven, and subsequent five year period of tenure under (iii); and with regards to (ii) after much heart-searching accepted that first aprointments would be "natives of Belfast [even if] not at present residing there, or to persons who have been practising for the past 6 months in this town or its neighbourhood": to import medical competitors would be "an act of unkindness if not injustice"[58]. From the 18 returns from the canvas of the Belfast doctors of 8 November, the committee also recommended the establishment of a clinical lecturer and eight professorships—chemistry; materia medica; practice of medicine; theory of medicine; midwifery; surgery; medical botany; and medical jurisprudence.

The report was received by the joint boards on 28 December and forwarded to the "faculty of the Belfast School of medicine and surgery", the hospital, and the Belfast medical fraternity[59]. The reply from the "faculty", signed by Henry McCormac, was swift and angry: the report they said ignored the need to start classes in 1831; widened unacceptably the eligibility to chairs to include expatriate Belfast doctors and those practising in the "neighbourhood" of Belfast; and by denying permanent tenure it discriminated against proposed medical staff and ignored the need for continuity in building up a school. They refused to resign their unpaid *soi-disant* professorships thus blocking all plans for joint progress[60]. The joint boards were alarmed and sought compromise. They agreed to establish the eight chairs as soon as possible; boosted the "clinical lecturer" to a "system of clinical lecturers"; agreed to permanent tenure; but rejected any limitation of eligibility to professorships. These decisions, however,

were enough to persuade the "faculty" of the goodwill of Inst and they reciprocated by dropping their demand for limited eligibility to the chairs—"they would waive what they consider their right"—and agreed that the "faculty" would dissolve itself if Inst would at once proceed with planning a curriculum and with the professorial appointments to commence classes on 1 November 1831[61]. This assurance was forthcoming[62]—though in the event action on the posts was delayed until 1835 through lack of funds—and on 1 February 1831 the "faculty" was dissolved[63]. This cleared the way for joint development with the principles of both hospital and college more or less intact.

This "hospital faculty" had lasted just over 3 months. It had served a purpose: it had shown hospital staff solidarity and enthusiasm, had provided a body independent of the hospital charity with which Inst could negotiate, and had had the good sense to disappear when its immediate attainable objectives had been reached. Only restricted eligibility to chairs eluded it: to compromise on this Inst would have had to compromise itself though the resolutions for open elections were never unanimous in the joint boards and the issue did not die until finally voted down at a special meeting of the court of proprietors (the governing body), procured by the medical lobby on 3 and 17 March[64].

The hospital could do no more: Inst had given assurances and these now had to be honoured. Inst now tried to meet its obligations in three ways: it turned to government and the public for money for new buildings; it asked its own members to draw up a "plan" for a medical school; and it arranged to fill what chairs it could in the meantime extending science-based instruction.

Buildings

A committee of the joint boards under James McDonnell in his capacity as an Inst "visitor", was established on 12 April 1831 to collect public subscriptions: it never conducted business and was replaced by a three-man committee of different members on 7 June[65]. By 6 March 1832, £405 had been collected and considered adequate to commission plans and estimates[66] despite government refusal of immediate help[67]. This building fund, however, was for general extension, not just medical buildings—increasing numbers were overflowing school and college classes[68]—and when in 1833 government finally agreed £1,000[69] (later £2,000 for the 1834–5 financial year[70]) on a pound for pound basis with Inst two projects were in hand: the first was the new north wing which would be used for college classes and a board room on the ground floor; the second was the medical building (mainly the anatomy rooms) which concerns us here.

The annual meeting of proprietors on 3 July 1832 resolved that there should be "immediate erection" of new buildings; their lack was holding back medical school developments[68]. The plans of the later superseded architect (John Miller of York Street)—which became the north wing—though "containing all the accommodation which the present state of the Institution requires"[71] were not appropriate for the special needs of medical teaching, especially anatomy, and after delaying until the first £1,000 was collected[72]—the 1832–3 cholera epidemic impeded fund collecting—Inst asked Drummond for his proposals for medical

accommodation and Drummond wrote to the joint boards proposing buildings in the "south west corner of the grounds" facing college square south[73]. This, and an alternative plan by Miller for a building behind the proposed north wing, were considered on 14 September 1833, Miller's plans were preferred, and Lord Donegall was approached for land "to rear of [main] building"[74]. Action however was further delayed: the promised government grant was not paid for another seven months[75] though in the meantime Drummond pressed for urgency, a second storey to the original plan was agreed, and Miller instructed accordingly[76]. There were now further delays due mainly to problems in piling the soft sub-soil in the main north wing contract[77]: it was now over three years since Inst had reached accommodation with the "faculty of the Belfast school of medicine and surgery"[62] and the board of visitors, sensitive to their obligations, now pressed the joint boards who in August 1834 set up a committee (four managers and three visitors including McDonnell, S. S. Thomson and Forcade who were also hospital staff members) to "enquire into the extent of the accommodation that will be required for the Anatomical and Chemical classes . . . and to produce estimates of the expense . . ."[77], Miller's plans and the proposed second storey to be reconsidered.

The committee reported three months later (25 November 1834) recommending plans for a single-storey building behind the north wing and a tender at £500 from Michael Gavecan (or McGavican)[78], an unsuccessful bidder for the north wing contract[79]. A project sub-committee was formed (Rev. J. S. Porter, Surgeon Schrott, Dr. J. D. Marshall, Mr. Edmund Getty) and the three-room building

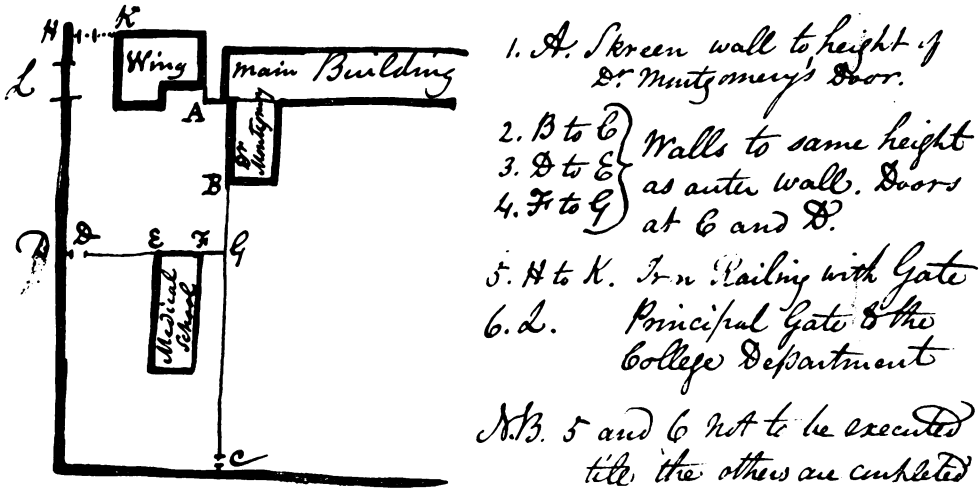


FIG. 1. *A sketch showing the size and position of the medical school and the proposed enclosure. The top of the sketch is east; the road to the north of the outer wall (HD) is College Square North. Much of the wall (GC) and all the outer wall westward from H still stand. The north wall gate built instead of the gate at L is not shown but was at the north west corner (opposite C) and still survives beside the British Sailors Society and Whitla Institute. (Sketch from minutes of the board of visitors of* 12 *December* 1835—*SCH*/524/7B/29; *reproduced by courtesy of the Board of Governors of RBAI and Public Record Office of Northern Ireland). Intensive search has failed to uncover the architect's plans for the medical school.*

(lecture theatre, dissecting room, museum, and associated privy) started at once, being half a storey high on 20 January 1835, the wall built and plaster laid by 3 March, the roof slated by 7 April, the ceiling plastered by 21 April, and the whole completed by 16 September except for certain extra internal works finished by December, all to a cost of £780[80] though insured for only £400[81].

On 1 December Drummond, now dean of the new medical faculty (see below), argued for enclosing the medical school from the rest of the buildings (anatomy was a loathsome business), for windows in the roof protected by wire-mesh, and for gas and water[82]. The enclosure* was agreed[83] and completed in April 1836 with "a Botanic Garden", all to a cost of £245.5.0; doors, windows and other fittings were in place by January and July to a cost of £26.1.5; water and gas were laid during the summer to a cost of £11.19.2 and £8.11.2 respectively, and ventilation installed at £1.10.0; the inner (walled) yard was paved in November to a cost of £4.1.10; and the year finished with the purchase of a stove, cases for the museum, and sundry items (omitting equipment) to a cost of £58.14.11 with £15.0.6 for unspecified repairs[84]. This building was in use from 9 November 1835 until 1863—the last 14 years by Queen's College students for dissecting rooms since their anatomy rooms were not completed—and with some later additions as science classrooms until 1953. They were now used as stores and for theatrical worshops (Fig. 2). The whole project from the first meeting of the subscription committee to installation of heating took over five and a half years.

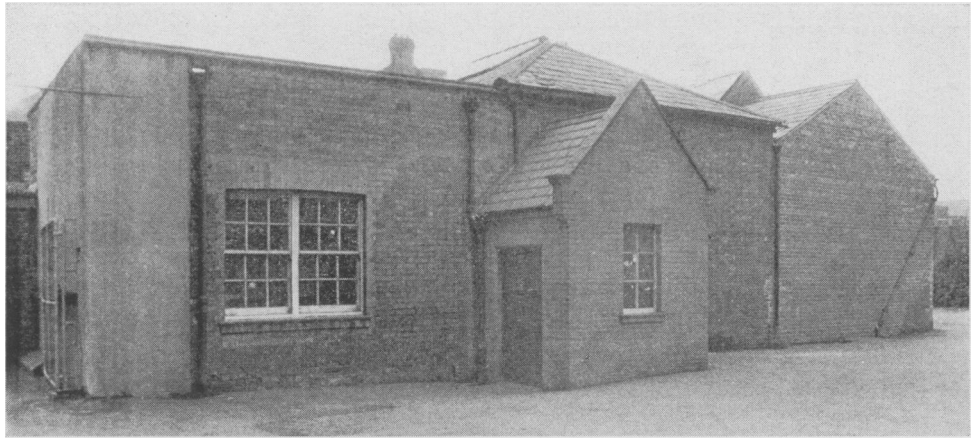


FIG. 2. *The present theatre workshop and stores at Inst* (A.I.), *previously the medical school building. The centre and nearest portion with some building out of sight comprise the original structure; some of the wings and porch were built later* (*Courtesy of the Board of Governors of RBAI*).

* The extent of the enclosure agreed can be seen in Figure 1 which is from the minutes of the board of visitors of 12 Dec. 1835 to proposals made by Drummond and Cairns (SCH 524/7B/29). In the event the gate at 'L' was not built: the north wall gate near the Whitla Institute was built instead.

Teaching

The joint boards had first considered the building project on 12 April 1831[65]; during that summer they turned their attention also to teaching and curriculum planning—the second of their "assurances" to the "faculty". First, however, they decided to advertise for a professor of chemistry "to be a physician", his tenure to be temporary, and his salary "to arise solely from the fees of the students" until medical chairs could be funded[85]: with Drummond he would form the pre-clinical school to start classes in November 1831 as agreed. Henry McCormac, physician to the fever hospital and secretary to the recently dissolved "faculty" and who had been its nominee for their chemistry "chair"[54], was an applicant[86] with William Mateer, later (in 1833) to be a dispensary physician at the fever hospital and (in 1836) professor of botany at Inst. Nothing however had been done about agreeing "a system of medical instruction" or "plan", so election was delayed until a "plan" was approved[87], and then deferred indefinitely—in the event for four year—despite further enquiries from McCormac[88] and from a Dr. Hugo Reid of Edinburgh[89]. In the meantime with scrupulous impartiality first McCormac and then Mateer were appointed to give daily popular chemistry lectures in the common hall[90].

But the main thrust was to develop a complete "plan": election, duties and terms for professors; curriculum affairs; examinations; rules for students; the general medical certificate etc. On 4 October 1831 a committee under R. J. Tennant (an Inst visitor) was appointed to "draw up a constitution for the proposed Medical School"[87]: this was presented on 6 December, was at once published, with interspersed blank leaves, and sent "to the most eminent Medical Men in the United Kingdom [for] their opinions on the subject", and a five-man committee again under R. J. Tennant but now including McDonnell was formed to collate the replies[91].

This "plan" ran to 10 octavo pages and 55 numbered paragraphs[92]. It cannot be discussed in detail here and anyhow was superseded by a revised "plan" in 1835 which in turn had to be amended before implementation (see page 121). Briefly, twelve chairs on five-year initial tenure were to be established, three (anatomy, physiology, and surgery—the first two held as a combined chair by Drummond) in 1832 and the rest at "the proper periods" in 1833, with an interval of at least 14 days between each election, as the hospital "faculty" had recommended, to allow multiple applications necessary with small potential numbers and contemporary flexible specialism. Clinical lecturers would be selected by the new faculty of medicine, not the joint boards—a minor sop to the hospital staff for losing their patronage of the chairs. A "general medical certificate" was to be established on a four-year course including general hospital attendance for the last three winter sessions each of 6 month (1 November—31 May) and 20 supervised midwifery cases; and, since no recurrent funds were available or even promised, emoluments were to be the fees of the students—one guinea (medical jurisprudence; comparative anatomy and natural history) to three guineas (anatomy; physiology; surgery; practice of physic) per session. A "Belfast Medical School" was to be formed consisting of the medical professors, holders of the

general medical certificate ("licenciates") of two years standing, and "other medical men residing in the province of Ulster who may be elected members", and to include honorary members both medical and lay. It would elect a president, two vice-presidents, and nine examiners (for the certificate), would meet quarterly and would generally also "watch over the interests of medical education in the Belfast College, suggest improvements to the Faculty and Joint Boards, and foster and encourage the growth of medical science in general, but more especially in the province of Ulster". It presaged a university-style convocation though it was to have wider powers in examining since it elected examiners directly.

The first replies to this "plan" from the "eminent medical men" are recorded on 7 February 1832 including one from Robert Graves, and the next on 3 April from Dr. Alcock of Dublin[93]. The total number replying is not recorded. On 3 July 1832 the joint boards abandoned any idea to commence formal classes in November, in fact for some time to come: building had not yet started (see page 116) and they were still "awaiting full comments" on the medical school plan[94]. Instead they encouraged and accommodated ad hoc classes: by Little in medicine for the (winter) sessions 1832–3, 1833–4, 1834–5[95]; by Drummond in botany for 1833 and 1834[96]; by Moore and Coffey in surgery[97], and by J. D. Marshall in materia medica and pharmacy[98], both for 1834–5; all in addition to the chemistry classes by Mateer and McCormac already noted[90]. No request was turned down though Drummond had to assure the joint boards that his advertised course in "natural theology" did not involve controversial dogma but was really "animal economy . . . along the lines of the first 19 chapters of Paley's *Natural Theology*"[39]. These classes, given in the common hall between 8.00 and 11.00 a.m. and 4.00 and 7.00 p.m.[97] were an expedient until building monies were available: little is known of them or who attended, but during this three-year period up to 15 students were enrolled annually for anatomy[100] and almost certainly more attended the hospital[28]. Certainly the lecturers, paid exclusively (except for the salaried Drummond) by the students, continued perhaps not entirely without pecuniary incentive.

Professorships

Inst was confident as early as August 1833[101] that the long-delayed government building grant would be paid for 1834–5, as indeed it was. No anticipatory action was taken; but from October 1834 the tempo noticably quickens: the ad hoc lectures are extended to include surgery and materia medica[97, 98], and Drummond's anatomy course (to start on 11 November 1834) is advertised "as being the commencement of a regular Medical School . . . [with] suitable buildings which are now in considerable progress", and placed in papers in Belfast, Newry and Derry[102]. On 5 May 1835 the lord lieutenant was optimistically (and unsuccessfully) petitioned for a Royal Charter—as had been awarded to University College, London—to enable Inst to award degrees[103]; and on 2 June the joint boards decided to advertise the first five chairs to start courses in November, the closing dates to be: materia medica and pharmacy, 6 July; theory and practice of medicine, 20 July; midwifery, 3 August; surgery, 17 August; and chemistry,

31 August. Also, "hospital attendance and clinical instruction at the Dispensary and Fever Hospital [would be part of] the system and additional classes to be established when deemed expedient"—evidence of the "jointness" of the enterprise[104]. Surprisingly, in view of the principle of "open eligibility" which had led to so much rancour with the hospital staff in 1830–31, and against the proviso of the 1831 "plan" (para 6) the advertisements were to be placed seemingly only in the Belfast newspapers; not even in the Derry and Newry papers, let alone those in the rest of Ireland or Britain[104]. Belfast practitioners might be favoured after all!

The joint boards now moved swiftly to fill the chairs, though not without initial problems. Drummond, already professor of anatomy and medical physiology for life, was appointed professor of botany for 5 years on 30th June[105], an appointment soon to be challenged (see page 123). On 14 July the three applicants for the chair of materia medica and pharmacy (George Hill Adam MD from Portglenone; James Drummond Marshall MD of Belfast; Surgeon Hurst of Belfast) were considered. Hurst's application set a problem: would the licensing bodies in Dublin, Edinburgh and London recognise classes given by professors who did not hold the MD[106]? The election was deferred; letters were written and replies sent to a seven-man sub-committee (including McDonnell and S. S. Thomson) which was also to review the 1831 "plan" and "report on . . . any other additional arrangements which they may deem necessary"[107]. Two weeks later an amended "plan" was approved by the joint boards (Fig. 3); it was essentially similar to the 1831 "plan" though now with a separate chair of the theory of physic, the option of the joint boards and faculty to hear each candidate lecture, and other changes mostly minor[108]. The committee also agreed that persons holding the MD "or in course of procuring it" would be preferred for the professorships because "an MD of 4 years standing is preferred [for teaching classes] by the Royal Colleges", but those without it "would not be excluded . . . because [the present system] will be greatly modified if not altogether superseded in the approaching legislative reform of our medical system"[109]—a reference to the select committee on medical education which was printed on 13 August 1834[110] though the first of the resultant 17 bills before the Medical Act of 1858 was not published until 1841[111].

On 1 September 1835 the joint boards agreed a revised timetable to fill the chairs over the next 6 weeks[112] starting with the chairs of the theory of physic, the practice of physic, and surgery. There was one applicant for the theory of physic chair (George Hill Adam MD of Portglenone[113] who had previously applied for the deferred chair of materia medica and pharmacy), none for the practice of physic, and both were deferred for a year when Adams again applied for the former (but the election was postponed on the recommendation of the faculty of medicine[114]), there were again no applicants for the latter[115], and finally the chairs were combined and ultimately not filled until 21 November 1837 when McCormac was preferred to Adam by 18 votes to one[116]. The other chairs were all filled on schedule. After a mishap, when the committee of the Ulster synod (who under the regulations could scrutinize applications and make their preference known to the joint boards before election) was inadvertently

PLAN

FOR

THE ESTABLISHMENT

OF A

MEDICAL DEPARTMENT,

IN

THE ROYAL

Belfast Academical Institution,

ADOPTED BY THE JOINT BOARDS,

4th August, 1835.

BELFAST:
PRINTED BY JOSEPH SMYTH, HIGH-STREET.

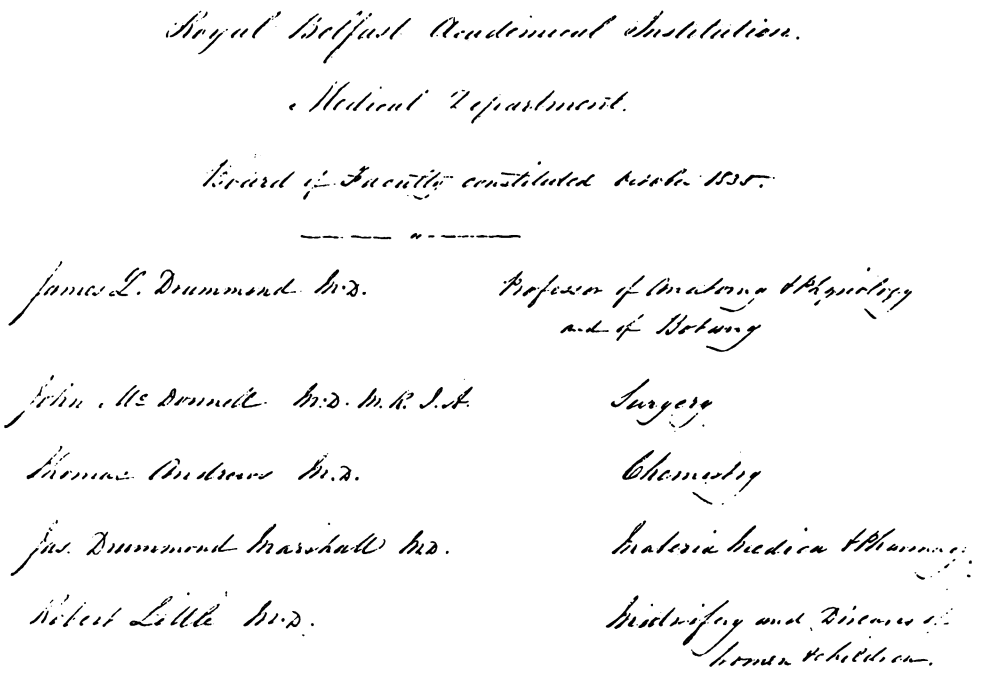
1835.

FIG. 3. *Title page of the* 1835 *"Plan"* (*see text, page* 123).

locked out of the Inst board room and the election had to be deferred[117], the chair of surgery went to John McDonnell, James McDonnell's second son, and the moderator's choice, by 13 votes to 7 for Robert Coffey and none to Surgeon Moore[118]. Thomas Andrews was elected to the chair of chemistry by 14 votes to 3 for John Deuchar (the moderator's choice and unsuccessful candidate to John Stevelly for the chair in 1823[119]), and 2 for William Mateer[118], a Dr. Moyne of Loughbrickland having withdrawn his application[117]; J. D. Marshall was successful for the chair of materia medica and pharmacy by 13 votes to 6 for Dr. Ninian Hall, the moderator again recommending the loser[120]; and Robert Little was unopposed for the chair of midwifery and diseases of women and children, getting 13 of a possible 15 votes, the moderator this time keeping silent[113].

The first creation of chairs was now complete, or nearly so. Drummond's election to the chair of botany[105] had run foul of the general synod: the moderator had not seen the testimonials beforehand[107]. Drummond at once resigned, then reapplied: this time the synod was consulted and on 20 October as the only candidate he was unanimously elected[121]. Andrews got £100 for equipment and £25 for chemical agents of a requested £150 capital and £60 p.a. recurrent[113]; McDonnell got £50 for "plates and preparations"[122]; Marshall got £10 for apparatus[113]; Little seemingly made no request.

Para 15 of the 1835 "plan"—"As soon as three Medical Professors are elected they shall constitute a separate faculty"—was now fulfilled and the first medical faculty in a collegiate institute in Ulster came into being. It held its first meeting on 8 October with the five professors as members: Drummond was elected "president" (or dean), Marshall honorary secretary, and Little honorary treasurer all for one year, and on the same day transacted its first real business—deciding that anatomy and midwifery lectures would start on 9 November 1835 and "other courses" on 1 May 1836 because the "laboratory and other rooms . . . were not yet completed"[123]. The unique enterprise had begun (Figs. 4 and 5).


Royal Belfast Academical Institution.

Medical Department.

Board of Faculty constituted 8th Oct. 1835.

James L. Drummond M.D. — Professor of Anatomy & Physiology and of Botany

John A. Mc Donnell M.D. M.R.I.A. — Surgery

Thomas Andrews M.D. — Chemistry

Jas. Drummond Marshall M.D. — Materia Medica & Pharmacy

Robert Little M.D. — Midwifery and Diseases of Women & Children.

FIG. 4. *First page of the Faculty of Medicine minute book, October* 1835. *(Courtesy of the Board of Governors of RBAI and the Public Record Office of Northern Ireland).*

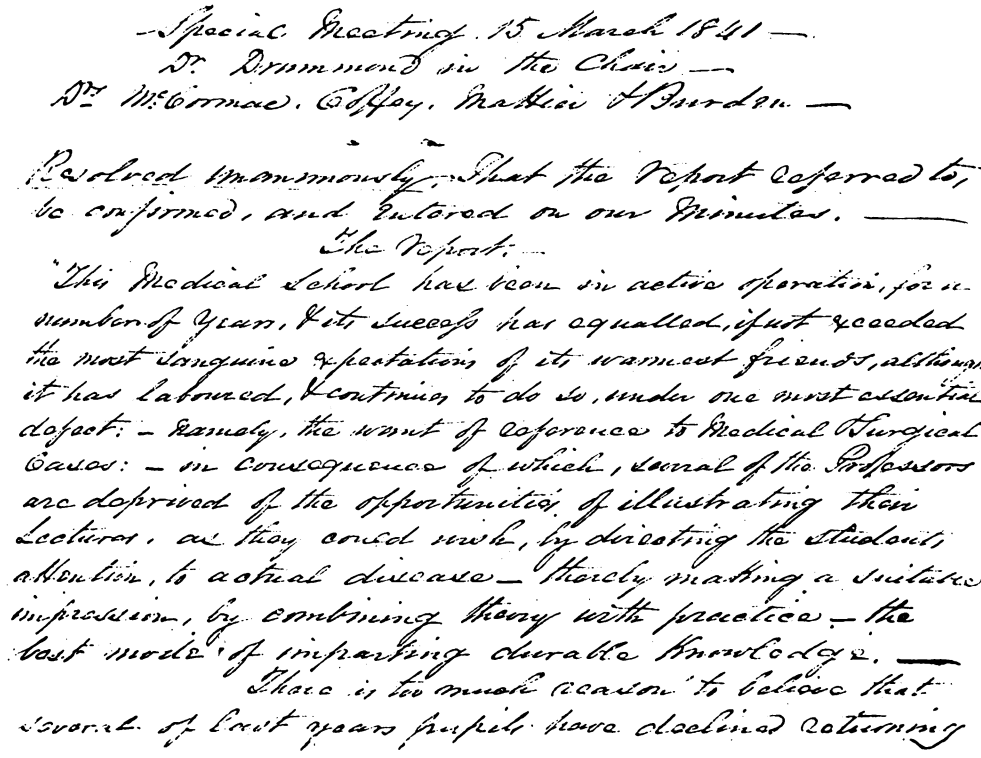


FIG. 5. *A page from the minute book for* 15 *March* 1841 *which contains Coffey's report on re-opening the Old Barracks, the last such appeal to the joint boards.* (*Courtesy of the Public Record Office and the Board of Governors of Inst*).

PROGRESS AND PROBLEMS, 1835–1838

The problems facing the faculty were formidable: would the licensing bodies recognise the "general medical certificate" in eligibility for their degrees and diplomas and so ensure student enrolment?; would government increase the annual grant to cover salaries of the medical professors and so ensure recruitment there being no great prospect of private endowments (though see page 133 footnote, for the Atkins endowment)?; where would funds come from for capital expansion—library, museum, extra buildings, equipment—and consequential revenue; and above all, could Inst and the hospital agree on issues which now divided them? The experiences of 1829–31 showed real enthusiasm among all concerned but also real problems for Inst appointees seeking teaching facilities in the hospital and for the hospi al itself in seeking joint arrangements with Inst (page 114).

Licensing body approval

Faculty turned to this problem at its second meeting[124] but postponed action until the summer of 1836 since the course proper would not start until November.

The first replies were not encouraging: Glasgow University were "quite opposed to the recognition of any new medical schools" and would not accept the Inst certificate as "part of the qualification of candidates for medicine and surgery honours in the [Glasgow] University"[125]. Marshall replied in spirited fashion: he knew that a Belfast medical school would reduce Glasgow enrolments and assured the university that students at Inst "would only be induced to attend our lectures for a season or two preparatory to studying in Glasgow, instead of going, as they now usually do, to the South of Ireland"[125]. No reply is recorded; nor was there immediate success with the "new metropolitan university" (the University of London, founded in 1836 as an examining and degree-giving body in arts, law and medicine for pupils of University College and King's College and "such other seminaries . . . as approved"[126]) despite a petition to the chancellor of the university[127], though ultimately—probably late in 1838—recognition was given[128]. But Glasgow and London (Edinburgh University and the Royal Colleges of Physicians were not approached since their statutes were exclusive[123]) were the only disappointments: the courses were recognised by the Apothecaries Company of Ireland on 30 September 1836 (materia medica) and on 18 October (anatomy and chemistry); the Faculty of Physicians of Glasgow on 7 November; the Royal College of Surgeons of England by 3 April 1837; the Royal College of Surgeons of Edinburgh on 28 August 1837 (qualified approval); the Royal College of Surgeons in Ireland, after some prompting[130], on 21 September; St. Andrew's University, for their doctor of medicine and doctor of surgery degrees, on 2 October; the Navy Medical Board on 28 August and the Army Medical Board on 29 August 1838; and the Society of Apothecaries of London finally on 4 October 1841 after previous applications had been seemingly ignored[131]. Glasgow University were pursued until February 1843 but no reply is recorded[132]. Thus non-exclusive licensing bodies all recognised the Inst course in greater or lesser extent and the enrolment of students was assured.

Professors' salaries, library, and specimens

Professors in the faculty of arts were paid £150 p.a.; Drummond similarly. The medical professors were appointed without salary since no government grant had been negotiated: initial emoluments were to be the fees of the students "which he is to receive entirely to himself"[108], a modest enough amount considering the maximum was three guineas per single six-month course per year and (in 1836–7) class enrolments of only seven (in natural history—Marshall's "second" chair) to 19 (in anatomy and chemistry)[126]. On 22 December 1835 an extra £600 on the annual grant was sought for the first six single or combined chairs at £100 p.a. each (midwifery and diseases of women and children, and natural history—J. D. Marshall; chemistry—Thomas Andrews; botany—Drummond, later William Mateer; surgery, and practical surgery—John McDonnell; and the theory of medicine, and the practice of medicine—not yet filled). Why less should be agreed than for other staff is not clear: perhaps an appreciation of what government might stand; perhaps because the staff had recourse to medical fees. Nothing was obtained for 1835–36 nor in 1836–37 but after further representation to government £300—for 6 chairs at £50 *not* £100 per annum—

was added to the grant for 1837–8[133] being "less than the boards requested [£100] and far less than they think the services and talents of the Professors justify"[128] and certainly was not "upon such a scale as they [joint boards] will consider at once liberal and judicious" as specified in the 1835 "plan" (para. 11). These salaries were paid until the medical school closed in 1849.

The school also required a museum, a library, and a supply of specimens especially cadavers. A museum was one of the three rooms in the medical building and Drummond, who had been early appointed "curator of the zoological and botanical departments of the [Inst] museum"[134], moved some specimens across. During 1836 cases and a stove had been supplied (page 118) but we know nothing of the extent of the museum though the equipment grant of £50 to McDonnell and successors was for surgical "plates and preparations". In their appeal for recognition to the Royal College of Surgeons in Ireland, Inst described the museum as containing "a fair proportion of good specimens"—though this may be overstated, but certainly students could use "the extensive museum of the natural history society"[135]. Nor was there endowment for a library: circulars were sent to "friends of Inst", and advertisements placed, asking for books or donations[136], and some acknowledgements are recorded[137], but the faculty's requests to the joint boards for a library grant was unsuccessful[138], and all that was done was to place medical books in separate cases in the main library[136]. On appointment each professor was to pay two guineas to the "medical library and museum fund" and the faculty were specially charged with care of the "medical library and museum"[108]; but funds were always scarce. In January 1841 Drummond did introduce a plan for an improved "Institution Medical Library" requiring an annual charge of ten shillings on faculty members and subvention from general funds, and pressed for a building extension or additional storey to house it, but it was largely overtaken by events[139].

Supply of cadavers was more successful. The joint boards asked the fever hospital for unclaimed bodies—now allowable for dissection under the Anatomy Act of 1832—and the hospital committee agreed "after stormy debate". They soon had second thoughts. This decision was rescinded at their next meeting: no reason was given but the provisions of the act was causing heart-searching in charity circles and Drummond had to appeal to Sir John Murray, "Inspector [for Ireland] of the Schools of Anatomy" under the act, and thanks "to his promptitude in supplying subjects for dissection", through an order to the "Lunatic Asylum" as well as a limited supply from Dublin, the anatomy class was "in a most flourishing state" and there was no further difficulty[140].

The Search for Clinical Facilities: The Royal Institution (or College) Hospital

The main problem facing the new faculty was procuring clinical teaching for its students and this raised at once the relationship with the Fever Hospital. All the licensing bodies required hospital attendance and instruction, usually in hospitals of at least 80 or 100 beds: this was vital to the development of the medical school; no "general medical certificate" could be issued without it.

The early attempts at partnership had left important questions unanswered: how could professors appointed by Inst an on *de jure* 5-year, but *de facto* indefinite tenure, be appointed *ex-officio* to the staff of the Fever Hospital who were yearly appointments, who had to practise two years in Belfast before being eligible for election[141], and when the charity drew its funds from grand jury presentiments and private subscription; how could the medical staff of the hospital expect to occupy chairs at Inst *ex officio* without sacrificing the Inst principle of unrestricted eligibility (see page 115). The hospital had acquiesced on the chairs; could they further acquiesce by appointing Inst professors to their staff? There was little immediate problem: of the first professors (Marshall; McDonnell; Little; Drummond; Andrews) Little was a hospital staff member since 1829; Drummond a past one (1814–1818); Andrews (in 1837) and Marshall (1838) would become so shortly; while Coffey, who succeeded Ferrar to the chair of surgery on 19 January 1837 and William Mateer who succeeded Drummond to the botany chair on 18 October 1836[142], were members from 1826 and 1834 respectively. But supposing any was replaced at annual election for the hospital staff; and what of future Inst appointments; and how could the dispensary district officers progress to the staff, as was the normal procedure[143], if staff posts were effectively blocked? Moreover, Inst had denied faculty membership to any but its own staff: the proposed "Belfast Medical School" would certainly include hospital staff members in a general advisory capacity and make them eligible as examiners, but no more than any other doctors in Ulster or Belfast licenciates whether in Ulster or not[108]. So far as Inst was concerned there was no special relationship with the fever hospital. These problems had exercised the Hanna committee in 1830–31 without solution (page 114).

In a 13-page letter to the Hanna committee, Robert Stephenson who succeeded Drummond to the hospital staff in 1818 wrote: "The Managers of the Institution [Inst] may either found a new hospital in immediate connection with their School, or avail themselves of the present Hospital establishment"[144]. He advised the latter provided the "privilege and duties" of the hospital staff were safeguarded, advice given also by James McDonnell who noted that the laws of the hospital would have to be changed[145]. In the event the hospital laws were not changed, nor were the college ones, and so founding a new hospital "in immediate connection with their School" became Inst's policy.

In 1835 the government offered for sale disused buildings in Barrack Street known as the Old Barracks. Built in 1737 on land leased from Lord Donegall by the commissioners for barracks in Ireland, they were set back from the street some 75 feet, were two storeys high, brick built, well slated and stoutly constructed. Fronting Barrack Street for about 65 feet and 25 deep stood the two-storied officers' quarters. The whole property was protected by a high wall with an iron framed and sheeted double gate, and the rectangular site measured 156 feet frontage on Barrack Street and was 130 feet deep. They were used from time to time as military barracks, less frequently after the new infantry barracks in North Queen Street (then Carrickfergus Street) were opened in 1798, and were now offered for sale by the Board of Ordnance[146] (Fig. 6).

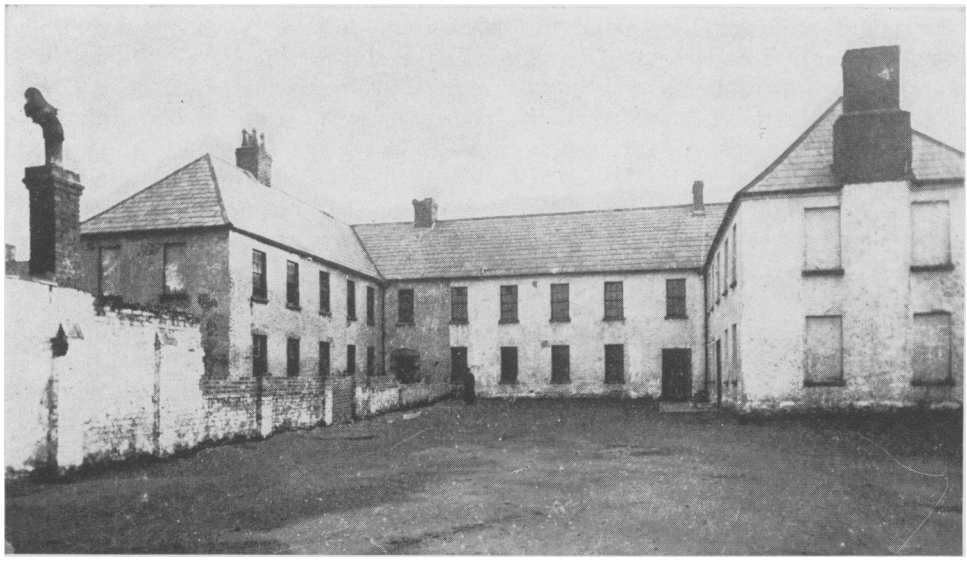


FIG. 6. *The Old Barracks of Belfast, Barrack Street: now a Christian Brothers School. This was the "Belfast Institution Hospital", or "College Hospital" (text page* 127). *(From the Welch Collection of January* 1894 *and reproduced by courtesy of the Ulster Museum).*

To the joint boards the property seemed heaven-sent: convenient alike for place and size, above all timely—the first session of the medical school was about to start—and seemingly assured of patients since the fever hospital was overstretched to cater for the rapidly growing population of Belfast[147]. They applied at once to the lord lieutenant for a grant[148] and opened negotiations through McDonnell (in his capacity as an Inst visitor) with the board of ordnance finally agreeing a price of £1,750 of which government agreed to meet half (£875) in 1836 provided a similar amount was raised by Inst[149]. The inevitable subscription sub-comittee was formed (James Tennant; Joseph Stevenson, the Inst secretary; Charles Thomson; with William Simms added later) and the joint boards anticipated its success by planning for a gate in the north wall of Inst fronting College Square North, thus halving the distance[150]. Three months later the first moiety of £875 was paid from an advance by the Belfast Bank (to avoid delay), and conveyancing arranged: the second moiety would be paid from the promised government grant[151] though this was not made, despite urgent appeals, until less than a month before the winter session started, and Inst did not obtain possession until 19 October[152].

Both the faculty and the fever hospital watched events closely. John Clarke, member of the hospital committee and sometime honorary treasurer, met the joint boards on 21 September "making enquiries with respect to the Old Barrack"[153]: he reported back favourably and the hospital committee then "expressed a desire to form a junction" with the proposed hospital which they considered would be "highly valuable"[154]. Thereafter the hospital kept a watching

brief. Not so the faculty: they and the joint boards moved swiftly. Within days of receipt by Inst of the government moiety (on 10 October) members inspected the Old Barracks. The south wing and half of the main building could be refurbished, repairing the walls and windows would be inexpensive, and "several rooms" could be made "immediately available for the reception of patients"[155]. Within the week they returned with an architect (Thomas Jackson)[156]: his report was forwarded two days later to the joint boards who at once formed a sub-committee to supervise repairs[157]. Within a further week the sub-committee reported: "Two wings and entire centre should be at once put into repair and fitted for the uses of the hospital . . . no attempt should be made to repair the roof of the front building [the former officers' quarters] or the roof of the building at the opposite corner of the yard [the former guard house] . . . [the whole] should cost not more than £200"[158]. Tenders to include also the gateway and lodge in the north wall "of sufficient size to admit carts . . . with ma+erials [cadavers]", were invited within 14 days and from the three received that of Campbell and Ross (at £148.7.0 plus £81.0.0 for the gate work) was accepted[159]. Inst could hustle when the need arose!

The repairs were completed by the middle of March 1837. While funds were being sought for equipment, furniture and bedding, faculty decided on an immediate medical presence: they asked the joint boards to open a dispensary in the ground floor of the former officers' quarters[146] at which "some" of the professors would work one hour daily as "a preliminary step to the establishment of a hospital", and at the same time scrupulously reciprocated the good offices of the fever hospital: "As these gentlemen [Little; Coffey; Mateer] are at present in connection with the Belfast Fever Hospital and Dispensary, and are entitled to prescribe for the poor in any part of the town, they do not consider they will be departing from their privileges by ordering medicine for the poor of the town in one of the rooms of the New Hospital . . . their . . . attendance . . . will draw . . . public attention . . . in this second Hospital"[160]. We know nothing of the work at the dispensary, or if it worked at all; but ironically the very factor that had impeded public fund-raising—"fever"—opened the hospital by another means.

Fever (mainly typhus), "almost unprecedented in severity", started in Belfast in March 1837. Admissions to the fever hospital quickly reached 80 per week, then 95 by June, and did not fall below 40 until January 1838[161]. The hospital was swamped: emergency outlets were urgently sought and the Old Barracks considered. The Reverend A. C. McCartney, a member of the hospial committee put the case to the joint boards on 18 May supported by a letter from Marshall, secretary of the faculty[162]. The boards agreed—someone else would now pay to equip their hospital—and that same day faculty elected Andrews and Marshall medical attendants while Mateer would look after his own convalescent patients transferred from the fever hospital[163]: the only running expense Inst would meet would be a porter—Samuel Deals (until 21 November 1837) whose widow carried on at 2/6d per week through 1838 and 1839[164]. The fever hospital committee now swiftly completed minor repairs, equipped the building as a 100-

bed emergency fever hospital with "well-aired wards" at a cost of £451.11.0 obtained from the reconstituted Board of Health, supplied a "house-steward, nurses, and other servants" the first-named for seven months at some 18/- per week, and on 2 June—just 14 days after the first approach to the boards—the first patients were admitted[161]. Four days later the hospital was formally christened "The Royal Institution Hospital"[165]: this title was seldom used and it remained the "Old Barracks"—briefly "The College Hospital"—until the end of its days.

Within a fortnight 162 patients had been admitted; but after June fever declined and the hospital closed on 1 November[161]. Inst now sought to capitalise on the emergency: while the faculty restarted its dispensary activities with the suggestion—not taken—of backing it by moving Little's "lying-in charity"[166], the joint boards sought to keep the furniture and equipment in the hospital on trust "in the same manner as the furniture of the Cholera Hospital was transferred to the Belfast Fever Hospital"[167]—a reference to the isolation hospital for cholera built in the former lock-ward house at the back of the fever hospital in 1830. The Board of Health had no power to authorise this, only the government[168]: and they seemingly refused though the furniture remained for some time[169]. The nurses, however, did not remain, nor was there money for medicine, light, heat, laundry, food and other expenses, and the hospital stayed closed to be let as it could. There were flickers of hope. The Chapel Lane Dispensary, short of funds, wished to move to the Old Barracks at cheaper rent and to augment the Inst dispensary, but the joint boards though allowing free rent drove such a hard bargain—patients to be available for teaching; a faculty member to be a medical attendant; all appointments to be approved by the joint boards—that it fell through[170]. More promising was the 1839 change in the grand jury presentiments: hitherto these had been used by the fever hospital for its general wants including non-fever cases in strict contravention of the 1807 Act[22], but from the spring assizes of 1839 these funds were to be exclusively for fever patients, other cases would be a charge on charitable monies[171]. Faculty saw a chance to breathe life into their hospital: with the main financial prop removed the fever hospital may not be able to support its non-fever cases; the college hospital might successfully enter the market[172]. They advised the joint boards accordingly but to no avail[173]: the bank loan to purchase the Old Barracks had not yet been paid off[174]; even the yearly ground rent of £11 was a drag; opening the hospital was impossible.

The enterprise of a college-controlled teaching hospital was dead; the opening of the Union infirmary (in 1841) and plans for the Queen's College buried it: only one further mention is made in the faculty minutes after 12 March 1839—an unsuccessful effort in March 1841 to force the joint boards to seek funds to open the hospital because "There is much reason to believe that several of last year's pupils have declined returning this session owing to this serious and acknowledged want [no teaching beds]; it is more than probable that some students of this session may be influenced by similar motives"[169]. Lettings were made on a market basis; a room to Henry Goodwin as a gymnasium[175], the main building to the Board of Health during the typhus epidemic of 1840 (8 months

at £2 per week)[171]; to the military as a base during O'Connell's visit in January 1841; unsuccessfully as a business store in 1842; to Boomer and Campbell, flax and tow spinners by which time it had been vandalised with a total of 177 panes of glass broken in the front, and all broken in the back, and an insurance value against fire of only £1,000; for unspecified purposes in 1845–6 grossing £35; and to the Board of Health and Poor Law Guardians more or less continuously during 1847 to 1849. After further lettings a long-term lease was given to Messrs. Grant at £120 p.a. in 1894. The site is now occupied by a christian brothers school[176].

So ended in stillbirth a unique conception, an accredited 100-bed teaching hospital owned and run by an academic "preparatory" college. The lesson was to be learned by the Queen's College and University—that the co-operation of the general and specialist hospitals is necessary to develop a full medical teaching programme—and they pursued this aim: there were to be no more College Hospitals. The statutes, however, of the Queen's College were restrictive: professors were crown appointments; only professors could be members of faculty; clinical lecturers and other part-time lecturers had no formal college standing; hospital staffs had no part in the machinery of professorial appointments or in expressing a formal opinion on college policy. The general hospital staff considered this unhelpful to the special position of medicine[177], as indeed it was: only with the Queen's University (1908) would clinical lecturers become members of faculty; and only in 1950 would there be a joint board of curators (university/health service) for clinical appointments. Not that restriction is a college preserve: Inst had no formal say in the appointment of clinical teachers; the professors continue to teach in hospital as they have done since 1835, only by virtue of any hospital post they hold; and the hospital continued for some time to attract students by virtue of fulfilling licensing body requirements not because of college policy. For many years the problems faced by Inst were avoided and cohesion ensured by informal means: three of the first four Queen's College medical professors were members of the general or lying-in hospital staffs and the fourth (John Creery Ferguson) became attending physician at the former within four years; and until the appointment of Harold Rodgers in 1947—98 years later—all the *clinical* professors and up to 1973 all the clinical lecturers and examiners, have been members of the Belfast hospital staffs. The Belfast Medical Society undoubtedly had a catalystic effect as a forum for the compact Belfast medical fraternity but although the proposed medical school was debated and encouraged by the Society after 1832 I am unable to accurately estimate its influence*. This led to parochialism no doubt and at a time of great medical developments; but it was a lesser evil and for good or bad Queen's clinical school and its traditions are largely an in-bred creation. Such is not unique though it is extreme in Belfast: most British universities have had similar problems and

* Hunter (*Ulst. Med. J.*, 5, 109) says: "In 1832, the subject of a Medical School for Belfast was raised, and it was through the activities of the Society that the formation of the school was realised in 1835. . . ." The relevant minute books are missing from the Society archives: efforts to find them are continuing but have so far been unsuccessful.

even Lister, on appointment in 1860 to the chair of systematic surgery in Glasgow, had to wait for 15 months for a vacancy on the Glasgow Royal Infirmary staff and then apply for it in competition[178].

Students and Staff

Despite the fiasco of the college hospital the first few years of the medical school were expansionist and productive: the faculty minute book exudes enthusiasm and confidence; the joint boards were sympathetic and helpful; 26 Belfast doctors—half the total in the town[179]—including 17 past or present staff members of the fever hospital or dispensary, expressed unqualified support in a letter of 12 December 1836[180]; and in 1841 faculty could endorse a report by Coffey stating ". . . its success has equalled, if not exceeded, the most sanguine expectations of its warmest friends"[169]. The number of *subject* enrolments nearly doubled between 1836 and 1837 (to 154) and the school turned out some 600 students in its 14 years, enrolments being highest in anatomy and surgery. We know nothing about these students: their background; where they took their license; where they worked; where they went—a subject for future research. They were well taught—the enthusiasm of the college and hospital staffs ensured that—and on a wide spectrum of cases (Table): the one great deficiency was non-integration of much of the theoretical and practical teaching due to the fever hospital

Table

Data on Admissions to the Fever Hospital "Surgical" Cases

Diagnosis	*Approximate percentage*
Aneurism	1
Burns	13
Cataract	3
Delirium tremens	<1
Erysipelas	5
Fracture (compound)	5
Fistula	3
Gangrene	2
Hernia	2
Joint diseases	11
Head injuries	7
Rupture of viscera	<1
Stone in bladder	<1
Syphilis	49
Tetanus	<1

Data based on *Malcolm, op.cit.*, App. xxv. The annual average number of admissions 1830-36 was: fever, 576, medical, 163; surgical, 447 (based on *Malcolm, op.cit.*, App. xxii.)

impasse—"the one most essential defect, namely the want of reference to Medical and Surgical cases, in consequence of which several of the Professors are deprived of the opportunities of illustrating their lectures, as they could wish, by directing the students' attention to actual disease—thereby making a suitable impression by combining theory with practice . . ."[169].

The professors were at best distinguished, at worst competent: and in Andrews Inst had one of the outstanding chemists of his day, elected FRS in 1849, honorary doctorate of four universities, president of the British Association, and offered a knighthood which he declined[181]. There were some early changes of staff. John McDonnell never gave a lecture; he resigned after three months to take a post at the Richmond hospital in Dublin[182] and was replaced by Thomas Ferrar; he never turned up, being concerned at a "defective element in the constitution of the School"—the then non-recognition by the University of London and the failure of the college hospital to which he had offered his services gratuitously—and instead went to Sligo and was dismissed on 22 November 1836[183] and in turn was replaced by Robert Coffey, consulting surgeon at the fever hospital since 1826. Coffey had waited some time: he had been defeated by McDonnell in September 1835 and, after two postponements because of unsympathetic anonymous letters "from a warm friend of Inst"[184], also by Ferrar (10 votes to 9) in July 1836[185], but unanimously elected in January 1837 as the only candidate despite opposition from the general synod—which was ignored once again[186]. Drummond resigned his second chair in botany in August 1836[187] and was replaced in October by William Mateer, attending physician at the fever hospital since 1834 and the only candidate, who polled 11 of 16 possible votes[188]. Henry McCormac was appointed to the combined chair of the theory and practice of physic in November 1837[116]; thus by the second session proper the three clinical professors, as well as Mateer (Botany) and from 1838 Andrews (Chemistry) were hospital staff members*. Only Drummond had an assistant—James Saunders MD, demonstrator in anatomy. Appointed for the winter sessions of 1835–6 and 1836–7 he was popular with the students who presented him with a case of lancets "for his great merit" before finally resigning in August 1837[189]. These then were the professors who took three lectures (Little) four lectures (McCormac, Coffey, Marshall, Andrews) or six lectures and additional demonstrations (Drummond) weekly through the six-month winter session (November - April) with regular classes in botany (Mateer) at 8.00 a.m., practical chemistry (Andrews) at 7.00 a.m. and practical midwifery (Little), as well as ad hoc classes in materia medica and surgery, during May, June and July, all augmented by clinical teaching and lectures at the fever hospital: truly a comprehensive contemporary curriculum[190] (Figs. 7 and 8).

---

* In 1836 the late Henry Atkins willed £40 p.a. to endow a chair of chemistry at Inst providing Henry McCormac was appointed to it. The joint boards accepted even though Andrews had been appointed to the foundation chair but the court of proprietors reversed the decision in July 1837[126]. McCormac's appointment to the combined physic chair was therefore timely.

MEDICAL SCHOOL.

Royal Belfast Institution.

SECOND SESSION.

THE following CLASSES will be opened, during the Winter Session, 1836-7 :—

ANATOMY AND PHYSIOLOGY.....*Jas. L. Drummond, M.D.*
27th October, 1836, daily, £3, 3s.

DEMONSTRATIONS AND DISSECTIONS .. .. } *Jas. L. Drummond, M.D.*
27th October, 1836, daily £4, 4s.

ANATOMY AND PHYSIOLOGY AND DEMONSTRATIONS AND DISSECTIONS, taken together, £6, 6s.

Dr. Drummond will be assisted by his Demonstrator, Dr. Sanders.

CHEMISTRY..... *Thomas Andrews, M.D.*
2d Nov. three days in the week, £2, 2s.

MIDWIFERY ..... *Robert Little, M.D.*
2d Nov. four days in the week, £2, 2s.

PRACTICAL MIDWIFERY .....*Robert Little, M.D.*
2d Nov. £2, 2s.

Each Student is allowed to attend at least thirty cases in connexion with the Lying-in Charity.

MATERIA MEDICA AND PHARMACY ..... } *James D. Marshall, M.D.*
2d November, three days in the week, £2, 2s.

SURGERY..... *Thomas Ferrar, M.D.*
2d Nov. five days in the week, £2, 2s.

The Medical Faculty earnestly beg to call the attention of the Profession, in the Province of Ulster, to the establishment of a Medical School in Belfast—so long a desideratum in the North of Ireland. They deem it unnecessary to point out the incalculable advantages derived from Home Education, in affording to the Student opportunities of advancement in his Collegiate Studies, equal to *those to be obtained abroad*, and at a much smaller expense. When it is considered, that the Province of Ulster embraces a population exceeding two millions, every one must be forcibly struck with the fact, that, until lately, no attempt has been made to establish such a School; and must, also, admit the necessity which exists, in the present advanced state of Science, for the supply of a want, so deeply affecting the interests, not only of the Profession, but of the community at large. The Medical Faculty, therefore, feel assured, that it is only necessary to make known the foregoing facts, convinced that this announcement will be met with that spirit, and followed up with that energy, which, in the other departments of Science, have raised the Institution to the rank which it at present holds, and which alone can ensure to the North of Ireland a Medical department equally efficient.

Every opportunity will be afforded the Students of pursuing *Practical Anatomy*, and the room will be constantly attended by the Lecturer or Demonstrator.

The Lectures will be delivered in conformity with the Regulations of the Royal Colleges of Surgeons, London and Dublin.

☞ The Medical Faculty earnestly request, from the friends of the Institution, donations to the Medical Library and Museum, of Books, specimens of Morbid and Comparative Anatomy, or statements of interesting cases in Medicine and Surgery, &c.; which will be carefully preserved, and the names of the donors recorded in a book kept for that purpose.

JAMES L. DRUMMOND,
President of the Medical Faculty.

Royal Belfast Institution, October, 1836.

FIG. 7.
Prospectus for the medical school session, 1836-7—its first session proper. (Courtesy of the Board of Governors of RBAI).

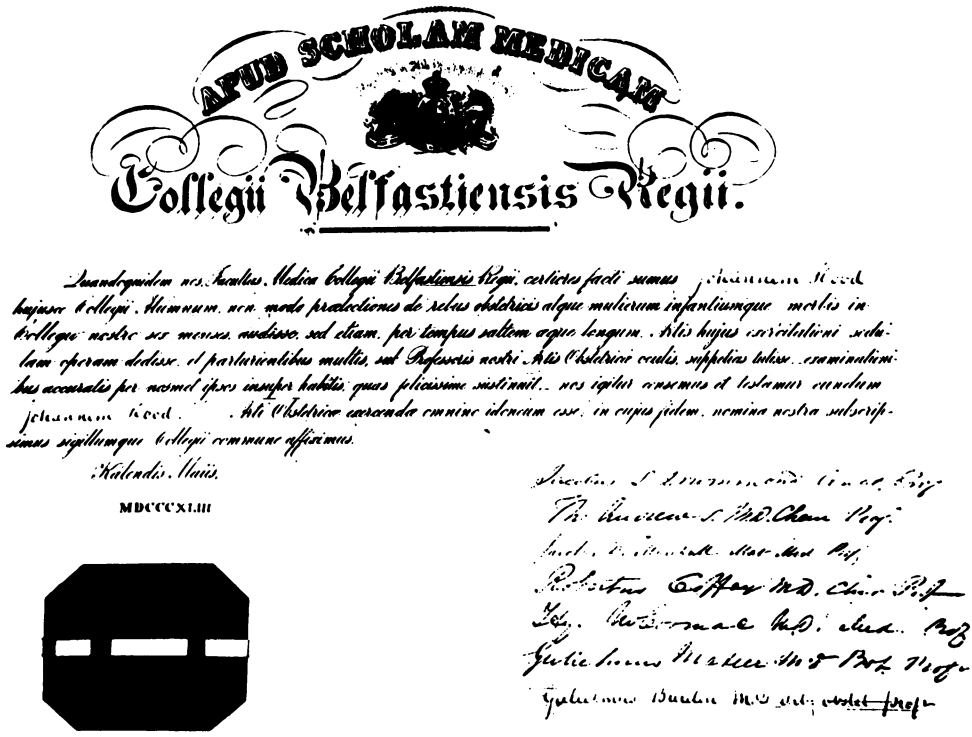


FIG. 8. *The General Medical Certificate issued to John Hood in* 1843 *and signed by the* 7 *medical professors. (Courtesy of the Board of Governors, RBAI).*

DECLINE AND ECLIPSE, 1839–1849

The medical problems of Inst, despite the college hospital affair, were not unsurmountable given a well-endowed school, good sense, and a more pragmatic approach to the fever hospital with reciprocation. But in fact the will and the means were not tested: the college base was collapsing. Chronically under-financed* Inst was now buffeted by the schismatic storms in the presbyterian church between "subscriptionists" and "Arians". This schism split collegiate Inst; the faculty of arts ceased to meet after January 1841; no general certificates were awarded; and the continuation of the college was in jeopardy. Furthermore, the workhouse infirmary—opened in 1841 with 6 beds which soon became 100 and, after 1847, 600[193]—took pauper patients who might otherwise have helped to rejuvenate the college hospital; and from 1844 it was clear that government plans for the "Northern College" as part of a new Queen's University in Ireland would compromise the position of Inst, as indeed they did. A decline in morale

* Inst never received more than £1,500 p.a., or 50% of capital projects for extension to the original buildings compared to over £2,000 p.a. to the Royal Cork Institution[191] and about £10,000 Irish p.a. to Maynooth College[192], neither of which had medical schools.

is evident from the faculty minute book, despite continued buoyancy of numbers[194]: minutes become perfunctory and sometimes missing; fines (1/-) are introduced in 1840 to improve declining attendance[195]; only one meeting is recorded for each of the last two sessions (1847–8; 1848–9), and no minutes for the latter are written[196]. The medical building fell into disrepair despite, or because of, increased student enrolments: in September 1843 a sub-committee of the joint boards found all the windows broken in the lecture theatre, the plaster fallen down, the railings and benches "torn down", and the outside encompassing wall unrepaired since it was part "blown down in a gale". The lecturers complained of crowding: Drummond and Coffey shared the theatre on rotation and Coffey asked for a partitioning of the museum, half for himself, but was refused[197]. Gone is the exuberance of the 1830s; in its place is mere routine as the bailiffs approach. The only innovation was a yearly course in the winter session in "medical jurisprudence and police" by Charles Hurst MD on a service basis in the common hall—required by some licensing bodies—started in 1840[198]. Government's final decision to build new accommodation to open in 1849 on higher ground—the Inst building, like much of the centre of Belfast, was insecure and had sunk in places by nearly one foot and was moreover considered to be unhealthy[199]—set the date for the funeral. The arch-"subscriptionist" Henry Cooke—"The Black Man"—stands imperious with his back to the gates of the college which he did so much to destroy.

In September 1849 The Queen's College, Belfast, opened and the collegiate department of Inst came to an end with the cessation of the government grant. Of the medical professors, three were taken over by Queen's (Burden, obstetrics; Gordon, surgery; and Hodges, who succeeded Andrews as professor of chemistry in 1848, to agriculture); three received gratuities of £250 (five years' salary as purchase of their five-year contracts) and were not appointed (McCormac, medicine; Mateer, botany; and Marshall, materia medica and pharmacy): Andrews became vice-president in 1848 and professor of chemistry in 1849; and Drummond—who alone was a life appointment—retired through ill-health on a pension of £150 p.a. and died four years later. Students at Inst were enrolled at Queen's and their Inst classes counted in credit for the new Queen's degree. This was not quite the end of the Inst medical school: the Queen's College buildings had inadequate anatomy facilities and the Inst dissecting-rooms were let at a rent of £25 p.a. and obligation to repairs, until 1863, anatomy lectures being given at Queen's from 1849, and students being peripatetic for 14 years for their anatomy classes[200]. The history of this decline has still to be written.

Epilogue

Those who would learn from history should try to learn the right lessons. What lessons does the Inst medical school teach?

The main lesson is a simple one: medical education is a continuum from pre-clinical classroom to specialist registration, responsibility divided by full registration between university and professional bodies. Universities require clinical facilities and hospital teachers for their students; in the post-full registration

period, training under professional bodies (royal colleges; joint training committees) requires university facilities and teachers for their training programmes. Joint collaborative bodies with necessary powers are logically required: the problem is that the claims of the university on hospitals is necessarily far greater than the claims of hospitals or professional bodies on the university. The university is seen as expansionist at the expense of hospital autonomy, and any joint body merely a convenient vehicle to extend this influence. The pre-registration year and the Merrison proposals for graduate clinical training, both university controlled, merely evidence further erosion of the hospital position before statutory university advance. Hospital staff expect and wish to train specialists and require training grade officers for the effective care of patients, but they exercise control through the royal colleges, their faculties, and joint training committees; with undergraduates, however, they are the junior partner with the university, don't need the students for patient care, and service teaching by university staff for specialist training programmes, and expertise from professorial units, are insufficient to be a recompense. Furthermore, hospital and university have different traditions and functions and cherish their autonomy and a right to preserve standards in their own way. In the face of these, how can the most effective collaborative bodies be created: indeed how can they be created at all?

Universities need hospitals more than hospitals need them; and they must show this by their actions. They must initiate changes and give more on compromise. Inst did neither: they dragged their feet to the "faculty of the Belfast medical and surgery school" (through lack of funds); they refused to compromise on appointments (through adherence to principle); they excluded non-professors from faculty membership (through adherence to uniformity); their Belfast Medical School—from which examiners were elected—considered all non-university doctors as equals; the fever hospital staff were not even more equal than others. They preserved their principles but were trapped by their own logic: independence is indivisible and the ill-fated college hospital was the result. Ironically, adequate funding, as eagerly sought, would not have helped—the college hospital would have been kept longer as a drain on resources; ironically also Inst considered a jointly-funded chair in botany—the first "joint-appointment"—with the Botanic and Horticultural Society[201] but seemingly did not investigate a similar possible arrangement with medical bodies or charities. Inst gave the hospital nothing: not restricted eligibility to chairs; not examiners nor curriculum planners *ex officio;* not permanent tenure of posts; not faculty membership; only ad hoc teaching accommodation mainly before 1835, and this partly in their own interests. Hospitals must also compromise, though not as much as universities: they must recognise that universities, even more than hospitals which directly serve the public, cherish autonomy to preserve academic standards and freedom. The fever hospital withheld the one thing they had to give—staff membership *ex officio* for Inst professors which they were unable to deliver even had they wished.

Today many, though not all, the lessons have been learnt. Universities have compromised mainly through necessity (a university-run hospital is impossible with 95 per cent of the enhanced "centre of excellence" costs being for service, i.e., non-academic purposes): at Queen's, clinical lecturers and examiners, and established part-time lecturers are selected from teaching hospital staff and are members of faculty since 1908; since 1950 appointments to academic clinical consultant posts are by a joint board of curators with five health service and eight university members; since 1972 such posts are tenured; also since 1972 faculty membership has been widely extended, even at the expense of 1st MB teachers, so that now 43 per cent of the 220 members are non-academic; the system of honorary posts for distinguished hospital consultants has also been extended with (1974–75) five honorary professors, four honorary readers, and fourteen honorary lecturers; since 1971 curriculum planning groups have teaching hospital consultant membership—and also students. The hospital too has compromised: the present dean is *ex officio* a member of one teaching hospital committee and one district executive committee and also a member of many committees at Area and Central level; the former clinical fee, now rolled-up with the academic fee, is administered by the university rather than the hospital staff; and most fundamental of all, since 1948 beds have been provided in the Royal Victoria, Mater Infirmorum, and City Hospitals, for members of clinical professorial units with associated hospital staff membership. University compromise has been greater than that of the hospital which is as it should be: hospital staff should recognise and acknowledge this fact.

Yet there are strains ahead. Changes in the structure of society, the profession and its organisation, and administration of health service facilities, have deprived hospital consultants of some power and patronage at the very time that the same changes have increased the authority of the university in the postgraduate field and may do so further. This is not cause and effect: much of the former authority has gone to statutory health service bodies *not* to the university. Losers, however, more quickly identify the winners than the reasons for their loss: it would be a pity if harmony was destroyed for reasons not of hospital or university making. More compromise may be demanded from both: if so it should be made. The real lesson of college and hospital over the last 150 years is that the cohesion and common educational objectives of the profession transcended the sectional interests of the institutions and a *modus operandi* emerged, which has proved flexible and resilient, without seriously violating principle. Its price has been compromise, goodwill, and good sense: its enemy confrontation, distrust, and entrenchment. If we learn this lesson then we have learnt from history after all.

ACKNOWLEDGEMENTS

It is a pleasure to record my thanks to the staff of the Public Record Office of Northern Ireland, the Principal and Registrar of the Royal Belfast Academical Institution, and the archivist's office, the Royal Victoria Hospital, for their help and unfailing courtesy, and to the Public Record Office, the Ulster Museum, and the Board of Governors of Inst for their permission to use and publish certain material. Certain expenses were met from the Arthur Black Bequest of the Faculty of Medicine, and the publication fund of the University.

Bibliography

I have relied mainly on the primary source material of Inst and the Fever Hospital. Secondary sources have been consulted and are cited where relevant, but I have made no effort to compile a comprehensive bibliography of such material.

The Inst documents are now lodged in the Public Record Office of Northern Ireland indexed under SCH 524. The minute books of the faculty of medicine, and of the joint board of managers and visitors, and the Letter Books, are regularly cited and for convenience in the following abbreviated form:

Minute book of the Faculty of Medicine, 1835-1849 (SCH 524/3C/2): abbreviated as *FM* below followed by the date of the meeting e.g. 8 October 1835 is 8.10.35.

Minute books of the Joint Board of Managers and Visitors, 1807-1864 (SCH 524/3A/1-6): abbreviated as *JB* followed by the volume number *viz.* I (1807-14), II (1814-21), III (1821-28), IV (1828-36), V (1836-43), or VI (1843-64), then the pagination, then the date of the meeting.

Letter Book of the Institution, 1818-1879 (SCH 524/7A/2-4): abbreviated as *Lett.Bk*, followed by the volume number *viz.* I (1818-33), II (1833-46), III (1846-79), then the pagination, then the date of correspondence where noted.

The Fever Hospital documents are lodged in the archivist's room in the east wing of the Royal Victoria Hospital. There are no staff or committee minutes extant for the period of this article, the main primary source being the printed annual reports *viz.*

The Annual Medical Report of the Dispensary and Fever Hospital of Belfast. Belfast: Alexander Mackay. These are abbreviated to *Rep.Fev.Hosp.* followed by the year (this was 1 May to 30 April for 1817-1829 and thereafter 1 April to 31 March), followed by the pagination. Malcolm's history (*The History of the General Hospital, Belfast, and the other Medical Institutions of the Town,* by A. G. Malcolm. Belfast: S. & G. Agnew, 1851) is the main secondary source.

References

1. *Report of the Committee of Inquiry into the Regulation of the Medical Profession.* Cmnd. 6018 (April, 1975).
2. *JB,* I, 10-17; *Statement of the Origin and Proceedings of the Belfast Academical Institution since its Commencement.* Belfast: J. Smyth, 21 December 1808.
3. 50 Geo. III, cap. 193.
4. *The History of the Royal Belfast Academical Institution,* 18-10-1960, by J. Jamieson. Belfast: Wm. Mullan, 1959.
5. *Royal Belfast Academical Institution: Centenary Volume,* 1810-1910, by J. R. Fisher and J. H. Robb. Belfast: McCaw, Stevenson & Orr, 1913.
6. *Fourth report of the commissioners of Irish education inquiry.* H.C. 1826-27 (82) xiii. 157, address of William Drennan MD, p. 6.
7. *My Life in Two Hemispheres,* by C. Gavan Duffy. London: T. Fisher Unwin, 1903, i, p. 52.
8. *JB,* IV, 97 (4.11.30).
9. *Edinb. med. J.,* **10**, 511 (1814).
10. Drummond to joint boards of 6 Oct. 1818 (SCH 524/7B/12/54); *JB,* II, 356 (3.11.18); *Fourth report . . . . inquiry, op.cit.,* evidence of Drummond, p. 101.
11. Drummond to joint boards of 2 Nov. 1818 (SCH 524/7B/12/57); *JB,* II, 358 (10.11.18), 359 (17.11.18).

12. Faculty to Simms of 9.11.18 recommending Drummond (SCH 524/7B/12/60); Drummond to joint boards of 15.12.18 (SCH 524/7B/12/62); *JB*, II, 361 (15.12.18). A Dr. Jacob enquired about the post: this was probably Arthur Jacob, then demonstrator of anatomy at TCD, and later the noted anatomist and medical polemicist and first editor and proprietor of *The Medical Press*. Jacob received his Edinburgh MD ("De Aneurismate") the same day as Drummond (*Edinb. med. J.*, **10**, 511 (1814)).
13. *Fourth report . . . . inquiry, op. cit.*, evidence of Drummond, p. 102.
14. *JB*, III, 129 (13.5.23).
15. *JB*, IV, 36 (5.7.29).
16. *JB*, II, 363 (29.12.18), 364 (12.1.19). The original instructions to the architects contained an anatomy suite—a dissecting room, a lecture room, a room for anatomical preparations, and a spare room "in the part of the building most removed from town" (SCH 524/7B/2/20/Schedule 1/5) but these were for later construction (Schedule 2/1-8). Nothing was built until the medical building in 1834-5.
17. *Lett.Bk.*, I, 147 (19.2.22), 174 (18.2.23).
18. Knight to joint boards 23.12.18 (SCH 524/7B/12/65); *JB*, II, 58 (27.11.21). Drummond agreed to waive his £50 p.a. salary until the grant was renewed (*Lett.Bk.*, I, 194-5 (31.7.23); *JB*, II, 148 (12.8.23)).
19. *The Seeds of Time: being a short history of the Belfast General and Royal Hospital*, 1850-1908, by R. S. Allison. Belfast: Brough, Cox and Dunn, 1972, p. 7.
20. *Belfast and its Charitable Society: a story of urban social development*, by R. W. M. Strain. London: Oxford University Press, 1961, pp. 150 seq.
21. *Malcolm, op. cit.*, p. 36.
22. 47 Geo. III, cap. 44.
23. *Rep. Fev. Hosp.* 1821-2, 5.
24. *Ibid*, 1819-20, 8-9.
25. *Allison, op. cit.*, p. 75; Hunter, R. H., 'The Belfast medical school', *Ulst. med. J.*, 6, 158-69 (1937).
26. *Malcolm, op. cit.*, p. 78.
27. *Allison, op. cit.*, p. 76.
28. *Rep. Fev. Hosp.* 1835-6, 11. Returns to the Inspector of Charities for Co. Antrim for 1834-1836 puts enrolled students somewhat lower at about 20 (QUB Library, MS1/68).
29. *Ibid.* 1823-4, 8-9.
30. *Newsletter*, 7 Nov. 1826. Reproduced in full in Strain, R. W. M., 'The foundations of Belfast medicine', *Ulst. med. J.*, **40**, 17-42 (1971). A biographical sketch of Drummond by S. Shannon Millin is in *The Belfast Natural History and Philosophical Society: Centenary Volume*, 1821-1921, edited Arthur Deane. Belfast 1924. There is no biography.
31. *Edinb.med.J.*, **1**, 511 (1805); **14**, 662 seq. (1818).
32. *Rep. Fev. Hosp.* 1823-4, 8-9; 1824-5, 10; 1825-6, 11-12.
33. *Fourth report . . . . inquiry, op. cit.*, p. 25.
34. Anning, S. T. 'Provincial Medical Schools in the Nineteenth Century'. In *The Evolution of Medical Education in Britain*, edited F. N. L. Poynter. London: Pitman Medical Publishers, 1966, pp. 121-34.
35. *JB*, III, 294-5 (7.11.26), 297 (12.12.26).
36. *Ibid*, 303 seq (6.3.27).
37. *Malcolm, op.cit.*, p. 83.
38. *Rep. Fev. Hosp.* 1826-7, 11-13.
39. *Ibid.*, 4.

40. *Malcolm, op. cit.*, pp. 82 seq. Biographical sketches of McDonnell are by Henry Riddell in *The Belfast Natural History . . . .* 1821-1921, *op. cit.*, pp. 91-2, and by Samuel Simms, 'The founder of the Belfast medical school', *Ulst.med.J.*, **1**, 34-8 (1932).
41. *Rep. Fev. Hosp.* 1827-8, 12-13.
42. *Ibid.*, 1828-9, 12.
43. *JB*, III, 320 (3.7.27).
44. *JB*, III, 317 (29.5.27).
45. *Fisher and Robb, op. cit.*, pp. 96 seq.; *Jamieson, op. cit.*, pp. 46-7; *JB*, IV, 18 (17.3.29).
46. *JB*, IV, 52 (20.10.29).
47. *JB*, IV, 54 (3.11.29).
48. *Edinb.med.J.*, **32**, 444 seq. (1829).
49. *Rep. Fev. Hosp.* 1829-30, 5-6.
50. *Malcolm, op. cit.*, p. 87.
51. *JB*, IV, 58-9 (17.11.29).
52. *Ibid.*, 59-60 (1.12.29).
53. *Lett. Bk.*, I, 353-5.
54. *JB*, IV, 93-4 (19.10.30).
55. *Ibid.*, 95 (30.10.30).
56. *Lett. Bk.*, I, 361-3 (1.11.30).
57. *JB*, IV, 97-8 (4.11.30).
58. *Lett. Bk.*, I, 367-70 (29.12.30).
59. *JB*, IV, 103-4 (28.12.30).
60. *Lett. Bk.*, I, 403-5 (3.1.31).
61. *JB*, IV, 105 (4.1.31), 106 (11.1.31); *Lett. Bk.*, I, 416-8 (18.1.31).
62. *JB*, IV, 107-8 (20.1.31), 111 (3.3.31).
63. *Ibid.*, 108 (1.2.31).
64. *Ibid.*, 111 (3.3.31), 114 (17.3.31).
65. *Ibid.*, 116 seq (12, 14, 19.4.31).
66. *Ibid.*, 166 (6.3.32).
67. *Ibid.*, 161 (7.2.32).
68. *Ibid.*, 182-3 (3.7.32).
69. *Ibid.*, 220 (23.4.33), 234 (16.7.33); Treasury to joint boards of 6 and 18.4.33 (SCH 524/7B/27).
70. Treasury to board of managers of 30.9 and 28.10.33 (SCH 524/7B/27); *JB*, IV, 279 (1.7.34).
71. *JB*, IV, 191 (7.8.32); building sub-committee minutes of 29.4.34 (SCH 524/7B/72).
72. *JB*, IV, 234 (16.7.33). Drummond himself subscribed £216.13.4 (*Appendix to the Subscription List . . . .* (SCH 524/8/6C)).
73. *Lett. Bk.*, I, 490 (9.8.33); *JB*, IV, 238 (20.8.33), 239 (2.9.33).
74. *JB*, IV, 239-40 (14.9.33).
75. *Ibid.*, 259 (11.1.34).
76. *Ibid.*, 262 (18.2.34); Drummond to joint boards of 3.2.34 (SCH 524/7B/28).
77. *Specification of the several artificers works to be done in erecting and completely finishing an addition to the Royal Academical Institution, Belfast*, **12 May 1834** (*SCH* 524/7B/28); *JB*, IV, 284 (19.8.34).

78. *Ibid.*, 296 (25.11.34).
79. *Ibid.*, 265 (1.4.34).
80. *Lett. Bk.*, II, 120, 185; *JB*, IV, 300, 308, 310-2, 321 under dates; *Statement of Accounts* . . . . (SCH 524/7B/72); miscellaneous lists for 1835 (SCH 524/7B/29).
81. *JB*, IV, 363 (19.1.36).
82. *Ibid.*, 355 (1.12.35).
83. *Ibid.*, 357 (15.12.35).
84. *Ibid.*, 368 (1.3.36); V, 7 (23.8.36); *FM*, 19.8.36; *Lett. Bk.*, II, 198; *Annual Report of the Royal Belfast Academical Institution laid by the Joint Board of Managers and Visitors before the Court of Proprietors, July* 4, 1837 (printed).
85. *JB*, IV, 130-1 (16.8.31).
86. *JB*, IV, 131-2 (6.9.31).
87. *Ibid.*, 133 (4.10.31).
88. *Ibid.*, 171 (3.4.32).
89. *Ibid.*, 176 (15.5.32).
90. *Lett. Bk.*, I, 438 (5.10.31), 445 (26.1.32); *JB*, IV, 161 (7.2.32), 166 (6.3.32).
91. *JB*, IV, 146-8 (6.12.31).
92. *Proposed Plan for the Establishment of a Medical Department in the Royal Belfast Academical Institution. Belfast*: Joseph Smyth, 1831; *JB*, IV, 153-9.
93. *JB*, IV, 161 (7.2.32), 171 (3.4.32).
94. *Ibid.*, 183 (3.7.32).
95. *Lett. Bk.*, II, 7 (22.10.33); *JB*, IV, 195-6 (4.9.32), 290-1 (21.10.34).
96. *Lett. Bk.*, I, 480 (26.2.33); II, 24 (18.3.34); *JB*, IV, 264 (18.3.34); Drummond to joint boards of 25.2.33 (SCH 524/7B/27).
97. *JB*, IV, 290-1 (21.10.34).
98. *Ibid.*, 295 (4.11.34).
99. *Ibid.*, 204 (20.11.32).
100. *Ibid.*, 206 (20.11.32), 257 (31.12.33), 300 (20.1.35).
101. *Lett. Bk.*, I, 490 (9.8.33).
102. *JB*, IV, 290 seq. (30.10.34).
103. *Ibid.*, 312 (5.5.35), 342 (10.9.35); miscellaneous letters (SCH 524/7B/29).
104. *Ibid.*, 318 seq. (2.6.35).
105. *Ibid.*, 325 (30.6.35).
106. *Ibid.*, 331 (14.7.35).
107. *Ibid.*, 331 seq (21.7.35).
108. *Plan for the Establishment of a Medical Department in the Royal Belfast Academical Institution adopted by the Joint Boards.* Belfast: Joseph Smyth, 1835; letter to joint boards from sub-committee of 3.8.35 (SCH 524/7B/29).
109. *JB*, IV, 337 seq (4.8.35).
110. *Report from the Select Committee appointed to enquire into and consider of the laws, regulations, and usages regarding the education and practice of the various branches of the medical profession in the United Kingdom.* H.C. 1834 (602—I, II, III) xiii.1.
111. *Bill for the regulation of medical practitioners.* H.C. 1841 (19) ii.573.
112. *JB*, IV, 340 seq. (1.9.35).
113. *Ibid.*, 346 (6.10.35); *Lett. Bk.*, II, 79 (7.10.35).

114. *FM*, 17.10.36.

115. *JB*, V, 17 (5.10.36), 23 (18.10.36).

116. *Ibid.*, 116 (17.10.37), 117 (7.11.37), 123 (21.11.37).

117. *JB*, IV, 342 (15.9.35).

118. *Ibid.*, 342 (10.9.35), 345 (29.9.35).

119. Deuchar to Stephenson of 24.12.22 (SCH 524/7B/16/37).

120. *JB*, IV, 345 (29.9.35).

121. *Ibid.*, 349 (20.10.35); *Lett. Bk.*, II, 79 (21.10.35).

122. *JB*, IV, 354 (17.11.35).

123. *FM*, 8.10.35.

124. *Ibid.*, 14.10.35.

125. *Ibid.*, 30.9.36.

126. *RBAI Annual Report* . . . . 1837 *op. cit; JB*, V, 93 seq (4.7.37); *Med. Press*, **1**, 137-8, 154-6 (1839).

127. *Lett. Bk.*, II, 166-9 (9.2.37).

128. *RBAI Annual Report* . . . . *July* 3, 1838 (Printed); *JB*, V, 173 seq. (3.7.38); *Lett. Bk.*, II, 301 (7.7.40); *Timetable of University of London examinations for* 1839 (uncatalogued miscellanea, RBAI library).

129. *Edinb. med. J.*, **41**, 250 seq. (1834).

130. *Lett. Bk.*, II, 193-4 (17.8.37).

131. *FM*, under dates of meetings following dates of letters cited.

132. *Ibid.*, 22.2.43, 14.4.43.

133. *Lett. Bk.*, II, 158, 206.

134. *Ibid.*, I, 78 (25.7.20); Drummond and Knight to joint boards of 7.3.20 (SCH 524/7B/14/7).

135. *JB*, IV, 354 (17.11.35), 363 (19.1.36); V, 4 (9.8.36), 37 (6.12.36); *Lett. Bk.*, II, 193-4 (17.8.37).

136. *JB*, V, 7 (23.8.36).

137. *FM*, 15.10.36, as example.

138. *Ibid.*, 17.9.36.

139. *Ibid.*, 16.12.40, 6.1.41.

140. Tennant to sub-committee of 13.10.35 (SCH 524/7B/29); Drummond to joint boards of 2.2.36; Murray to Inst of 8.2.36 (SCH 524/7B/30); *JB*, IV, 355 (1.12.35), 357 (15.12.35), 361 (5.1.36), 364 seq. (2.2.36).

141. *Rep. Fev. Hosp.* 1826-7, 4 (resolution 11).

142. *JB*, V, 47 (19.1.37), 23 (18.10.36).

143. *Rep. Fev. Hosp.* 1832-3, 6 seq.

144. *Lett. Bk.*, I, 371 seq. (28.12.30).

145. *Ibid.*, 414-5 (18.1.31).

146. Bigger, F. J. 'The Old Barracks of Belfast', *Ulst.J.Archaeol.*, **17**, (2nd series), 74-8 (1911).

147. *Rep. Fev. Hosp.* 1835-6, 8.

148. *JB*, IV, 347-8 (13.10.35), 349 (20.10.35); joint boards to lord lieutenant of 13.10.35, Spring - Rice to Morpeth of 21.10.35 (SCH 524/7B/29).

149. *Ibid.*, 360 (29.12.35); Treasury to Inst of 22.12.35 (SCH 524/7B/29).

150. *Ibid.*, 368 (1.3.36).

151. *Ibid.*, 381 (31.5.36), 385 (21.6.36); *Lett. Bk.*, II, 112 (1.6.36); 60 proprietors guaranteed the loan of £875 (plus 5% p.a. interest) with amounts from £20 to £50 each to a total of £1,840 (QUB Library, MS1/69/13).

152. *Ibid.*, V, 16 (27.9.36), 19 (10.10.36), 25 (25.10.36); Board of Ordnance to Inst of 19.10.36 (SCH 524/7B/30).

153. *Ibid.*, 13 (21.9.36).

154. *FM*, 30.9.36.

155. *Ibid.*, 17.10.36.

156. *Ibid.*, 22.10.36.

157. *JB*, V, 25 (25.10.36); Simms to the 6 members of the sub-committee of 25.10.36 calling a meeting for 27.10.36 (QUB Library MS1/69/15).

158. *Ibid.*, 26 seq. (1.11.36).

159. *Ibid.*, 29 (15.11.36); *Specification of the several artificers . . . . , op. cit.*, 12.5.34 (SCH 524/7B/28).

160. *FM*, 11.3.37; *JB*, V, 59 (29.3.37).

161. *Rep. Fev. Hosp.* 1837-8, 6 seq.

162. *JB*, V, 67 (18.5.37).

163. *FM*, 18 and 25.5.37.

164. *JB*, V, 125 (21.11.37).

165. *Ibid.*, 76 (6.6.37).

166. *FM*, 20.10.37, 6.12.37.

167. *JB*, V, 117 seq (7.11.37).

168. *Ibid.*, 141 (2.1.38).

169. *FM*, 15.3.41; *JB*, V, 339-40 (16.3.41). There is an extant inventory of the furniture and equipment, undated, but lodged in the 1842 papers. Simms (assistant secretary, Inst) has written on the outside "All these articles taken to the Fever Hospital": presumably these were the original purchases by the Board of Health for the Fever Hospital which were moved to the Old Barracks in May and June 1837. The articles range from 48 iron bedsteads, 115 pairs blankets, 80 sheets, 109 bed rugs, down to 2 slop buckets and one wash tub. All the cutlery, kettles, teapots etc. are tin (SCH 524/7B/36).

170. *JB*, V, 156 seq (24.4.38; 1.5.38).

171. *Rep. Fev. Hosp.* 1839-40, 9 seq.

172. *FM*, 9.3.39.

173. *Ibid.*, 12.3.39.

174. *JB*, V, 173 seq (3.7.38).

175. *Ibid.*, 241 (5.2.39).

176. *Lett. Bk.*, III, 8 seq.; *Jamieson, op. cit.*, p. 71; *JB*, V, 410-1 (1.11.42), 415-6 (20.12.42); Report of R. Christie of 13.12.42 (SCH 524/7B/36).

177. *Malcolm, op. cit.*, p. 90.

178. *Joseph, Baron Lister: Centenary Volume*, 1827-1927, edited A. Logan Turner. Edinburgh: Oliver and Boyd, 1927, p. 9.

179. *The Belfast Directory*, 1839, pp. 155-6.

180. *Lett. Bk.*, II, 161-2 (20.12.36).

181. *Fisher and Robb, op.cit.*, pp. 82-3; *Queen's, Belfast* 1845-1949: *The History of a University*, by T. W. Moody and J. C. Beckett. London: Faber and Faber, 1959, vol. II, pp. 582-3.

182. *JB*, IV, 363 (19.1.36).

183. *Ibid.*, V, 32 (22.11.36); *Lett. Bk.*, II, 148 (17.10.36), 155 (15.11.36); Ferrar to Inst of 2.11.36, 19.11.36 (SCH 524/7B/30).

184. *Ibid.*, IV, 367 (29.2.36), 369 (1.3.36).

185. *Lett. Bk.*, II, 112 (24.6.36), 113 (5.7.36); *JB*, IV, 393 (5.7.36).

186. *Ibid*, V, 47 (19.1.37); *Lett. Bk.*, II, 156 (19.1.37); General Synod to Inst of 18.1.37 (SCH 524/7B/31). Coffey was popular with students who on 26 April 1839 presented him with an illuminated address now in my possession.

187. *Ibid.*, 4 (9.8.36).

188. *Ibid.*, 23 (18.10.36).

189. *Lett. Bk.*, II, 150; *JB*, IV, 377 (3.5.36); *FM*, 17.9.36, 28.8.37.

190. *FM*, 3.4.37, 2.12.40, 17.2.41, 17.4.41, 23.3.42, 22.2.43, 6.4.44.

191. *Seventh report . . . . inquiry*, H.C. 1826-27 (443) xiii.501, p. 36 (Appendix 11).

192. *Eighth report . . . . inquiry*, H.C. 1826-27 (509) xiii. 537, p. 7.

193. Craig, D. H., 'A history of the Belfast City Hospital', *Ulst. med. J.*, **43**, 1-14 (1974).

194. *FM*, 5.12.45; Annual report of the joint boards, 1843 (SCH 524/7B/37).

195. *Ibid.*, 28.10.40.

196. *Ibid.*, 2.10.48.

197. Sub-committee report to joint boards, Sept. 1843 (SCH 524/7B/37).

198. Hurst to joint boards of 17.10.43 (SCH 524/7B/37); *FM*, 1.1.43.

199. *Moody and Beckett, op. cit.*, vol. 1, pp. 84 seq.

200. *Ibid.*, pp. 148-9.

201. *JB*, IV, 370 (16.3.36).

THE LEGACY OF RICHARD BURDON HALDANE

THE UNIVERSITY CLINICAL UNITS AND THEIR FUTURE

by

PROFESSOR O. L. WADE, M.D., F.R.C.P., F.R.C.P.I.(Hon.)

Department of Therapeutic and Clinical Pharmacology
University of Birmingham

INAUGURAL LECTURE AT OPENING OF WHITLA MEDICAL BUILDING, 28th MAY, 1976

Vice-Chancellor, Dean, Ladies and Gentlemen,

I am twice honoured today. Firstly I have been asked to declare the new Whitla Medical Building open. Secondly I have been invited to give this inaugural lecture.

When the Queen's College of Belfast was established in 1848 there had already existed since 1810 the Belfast Academical Institution (Royal after 1831). The General Hospital had been built in Frederick Street in 1817, anatomy had teaching begun at Belfast Academical Institution (Inst.) in 1818, resident pupilships had started at the General Hospital in 1820, clinical lectures had started there in 1827 and an embryo Faculty of Medicine had been established at Inst. in 1835. So Queen's started with a strong medical bias. Indeed in 1878, a quarter of a century after its foundation 51 per cent of its students were medical students, and even when I arrived in 1957 the idea that Queen's was "a great Medical School with a University attached" still persisted.

At the beginning, as was usual in those days, the University staffed the preclinical departments. It was the physicians and surgeons of the General Hospital (later to be the Roval Victoria Hospital) and the Union Hospital (later to be the Belfast City Hospital) who were the clinical professors. They had their own practices, gave their time free to the hospital and worked as university clinical professors for a honorarium of £120 per annum. They were giants.In surgery, there was Alex Gordon who after 37 years in the chair was succeeded by John Sinclair who was also Professor of Surgery for 37 years. In Medicine there was Ferguson, Cumming (in the Chair 34 years) and Lindsay. In Obstetrics Burdon, Dill and Byers (33 years). The lectures in Medical Jurisprudence were given from 1848 to 1899, 51 years, by Prof. Hodges, the Professor of Agriculture—he was medically qualified but it does have a touch of the Guinness Book of Records about it.

To this distinguished professoriate came in 1890 at the age of 39 to the Chair in Materia Medica, William Whitla. The Chair had had three previous appointees. Thomas O'Meara was appointed in 1849 but resigned before the first session. H. A. Stewart was appointed aged 28. He was a surgeon at the General Hospital. He died nine years later of tuberculosis. J. S. Reid, Physician at the General Hospital and Medical Officer to the Belfast Union Fever Hospital was appointed in 1857. Although good no doubt on fevers, for cholera, typhoid and typhus were preva-

lent in Ireland at that time, he was an appallingly bad teacher. His classes were often in uproar, perhaps with some justification for one of his students later said "The hours spent attending the Materia Medica classes were the most inexpressibly dreary experience of my life".

The short dark portly Whitla had started his professional life as an apprentice in chemists' shops, first in his home town, Monaghan, and then with Wheeler and Whittaker, in Belfast, before qualifying at Queen's in 1873. He became a much beloved and a wise physician. He was knighted in 1902. He became an M.P., representing Queen's at Westminster, in 1919. Whitla brought new life and vigour to the Chair of Materia Medica. He was a brilliant lecturer. He was such a dramatic storyteller that he might have been an actor, and he was a great lover of the stage especially Shakespeare. To help his students (and himself) he wrote and published a great text book 'Materia Medica and Therapeutics'. It was to run through twelve editions and it was with the proceeds that he built, furnished and presented to the Ulster Medical Society the Whitla Medical Institute in College Square North.

Whitla wrote another famous book, his 'Dictionary of Treatment'. It was published simultaneously in the United Kingdom and the United States and the 8000 copies of the first edition in the U.K. sold so rapidly that 2000 copies had to be imported from the States. The Chinese edition was much prized by the author.

The Queen's Colleges when Whitla was appointed were not popular in Ireland. Let me remind you that Queen's was born in tempestuous times. In the 1830's and 1840's Ireland was, as always, troublesome and when Robert Peel took office in 1841 he and his home secretary tried to conciliate and solve some of the unhappy problems of the times by appointing a Commission on Land Tenure, and by establishing the Queen's Colleges at Cork, Galway (they looked at Limerick first) and Belfast. They were to be open to students of all persuasions and the idea was denounced by Peel's opponents as 'a gigantic scheme of godless education' which 'panders to everlasting damnation'. At the time Whitla was appointed the Colleges were still regarded as something patronisingly imposed by Peel and the English. In Belfast there was so little local and civic support that in 1901 President Hamilton created the 'Better Equipment Fund'. He did this not only to get funds but also to stimulate interest and concern for Queen's in the community and influential citizens were asked to sit on this committee with professors. Financially the appeal was only moderately successful. It took four years to reach £27,000, but included in that was £5,000 from Sir James Musgrave to endow the Chair of Pathology. Indeed Queen's was for many years the most financially poor university in the United Kingdom for it did not attract from the great industrial and commercial families of Northern Ireland the generous endowments which their contemporaries in English cities gave to other British Universities. There were, (and I am referring to the times up to 1946 when U.G.C. support first came to Queen's) only three major bequests. Henry Musgrave, who had endowed a Chair in Spanish in 1920, left £57,000 when he died a few years later. J. C. White a former Lord Mayor left £60,000, and Sir William Whitla when he died in 1933 left his house, Lennoxvale, and £35,000 to the University. His fortune, it is believed, was due to judicious investment in Burmah Oil at a time when his

contemporaries were naively investing in the County Down Railway Company, which was laying down 5' 6" guage lines for an express to run from Belfast to Ballnahinch!

It is therefore very right and proper that Queen's should honour the memory of Sir William Whitla by naming the Whitla Medical Building after him. It is a pleasure too, to record that Queen's has now honoured its promise to the Ulster Medical Society by including in the building accommodation for the Society for which Sir William in his time did so much. The Ulster Medical Society was founded in 1862 by the fusion of the Belfast Medical Society (founded 1806) and the Belfast Clinical and Pathological Society (founded 1853). The history of the Society has been recorded by Dr. Strain, and Professor D. A. D. Montgomery in his notable Presidential address last year gave an outline of the way in which it has enriched the intellectual life of the medical profession in Northern Ireland; I am sure that I speak for you all when I wish the Society an active, happy and long life in its new home.

The new building is to house the University Clinical Units of Therapeutics, Geriatrics, Oncology, Mental Health and Anaesthetics, so that it is appropriate that I should now pick up the main theme of my lecture. I wish to outline the development of university clinical units, give you my assessment of their achievements, discuss their difficulties and indicate how I believe they should develop in the future.

The Haldane Commission

On 24th February 1909 Edward VII entrusted 'our right trusty and beloved Councellor Richard Burden Haldane, Principle Secretary of State for War' and seven others with the Commission "to enquire into the working of the present organisation of the University of London". There is no need for me to rehearse the problems of London University at the turn of the century. It was a conglomerate of colleges and institutes of variable calibre, the University had no control on the quality of teachers appointed and there was in its Senate conflict between incompatible ideas of what constituted a university—some believing that training in a university under university teachers was the essence of university education, others that it sufficed if a university laid down a syllabus and gave its degrees on the results of examinations. I am concerned with the evidence given to the Commission about medical education in London, by Professor Starling, Abraham Flexner and Sir William Osler. All these three accepted that a university ought to be somewhere that learning takes place in an environment of research.

Professor Starling explained that in London, as here in Belfast, the medical schools were older than the university. They had grown up in the large hospitals of the metropolis with the physicians and surgeons teaching young men who walked the wards. In the second half of the nineteenth century, when it became clear that a doctor needed a grounding in chemisty and a competence in anatomy and physiology, appropriate teachers of chemistry, physiology and other subjects were employed as servants of the medical school to teach these subjects to their

students. The operative word is servants. They had little to say in the general programme of education, they were not treated as equals by the clinicians and there was no interplay between their scientific discipline and clinical medicine.

Abraham Flexner fresh from producing comprehensive reports of medical education in the United States of America, Canada and Europe criticised the clinicians. "No progress has been made of formulating the concept of a clinician in the sense of a pathologist or a physiologist". "Just because a man is an accomplished physician he is not necessarily a teacher". "He has no interaction with fundamental scientists and he lacks the time and training to bring to bear on a clinical problem, the artillery the chemists and the pharmacologists are forging". "Their hospitals may be well designed for the care of the sick but laboratories need to be extended and their staff reorganised if they are to give an education of university standard". Flexner's solution was to create a university hospital staffed with scientific clinicians devoted to teaching and research.

Sir William Osler agreed with these criticisms but said to the Commission "The problem is how to place a dozen or more teachers in every medical school in the same relationship to the University as a Professor of Physics or Physiology". Osler's solution was for the university to create university clinical units of medicine, surgery and obstetrics. He approved highly of the successful English apprentice system of clerking and dressing and explained how he had introduced this to Johns Hopkins Hospital, amalgamating what he thought best of the British and German educational systems. "The professor of clinical medicine is not a mere theorist any more than other men of science are. His science is the natural history of disease. The experiments he observes in the first instance are nature's experiments exemplified in the patients in his wards".

The Haldane Commission was profoundly impressed by this evidence and it recommended the establishment of university clinical units in three medical schools which were to be an intregral part of London University and not merely affiliated colleges. In the event nothing happened, for a few months later "the lamps were going out all over Europe".

University Clinical Units

After the war the first university clinical units—a Chair of Medicine and a Chair of Surgery were created not in London, but at the newly founded Welsh National School of Medicine (Professors Kennedy and Sheen). Progress elsewhere was slow. Not only was it difficult to create chairs and insinuate them into long established medical schools, but suitably qualified men to take the chairs were hard to come by. Table I shows that by 1943, 30 years after Haldane's Report, there were in Britain still only 16 full time university clinical chairs. The Goodenough Report (1944) was given strong evidence in support of university clinical units by the staff of University College Hospital and by Sir Thomas Lewis —and indeed the Report was colloquially known as 'The gospel according to Gower Street'. As a result in the 25 years since the war, university clinical units have been established in all medical schools, London however lagging behind provincial schools. Here in Belfast, Professor Macafee was appointed to the

TABLE I

FULL TIME CLINICAL CHAIRS
1943

UCH London	M S O
Barts	M S
Marys	M S
Welsh National	M S
London	M
St. Thom.	M
Bristol	M
Manchester	M
Durham	M
West London	O (vacant)
Glasgow	O

M=Medicine, S=Surgery, O=Obstetrics

Chair in Obstetrics in 1945, Harold Rodgers to the Chair in Surgery in 1947, Graham Bull to Medicine in 1951. Queen's was one of the first to establish a full time clinical university unit in Therapeutics, when I was appointed in 1957.

This remarkable British innovation of putting university clinical units into teaching hospitals where they work alongside non-university physicians and surgeons has worked in general with success—but the success has varied from school to school, and within a school from discipline to discipline. All who have worked in university clinical units are aware of their advantages and disadvantages.

Advantages of University Clinical Units

The first and greatest advantage in my personal opinion—and I have worked in a non-university research institute and I have visited hospitals in other countries established primarily for research—is that it has ensured that those who work in university clinical units have remained as deeply concerned as any other physicians working in the hospital about their patients—about the relief of suffering, about compassion and the relief of those who are "dis-eased". Every clinical professor knows that the standing of his unit in his hospital depends on maintaining the highest standards of patient care and that long after our students have forgotten what we teach them—they remember our attitudes.

Secondly British university medical students have been able to continue to receive the benefits of medical clerking and surgical dressing that bring them close to patients. This they get from the non-university physicians and surgeons of the teaching hospital. The university clinical units although they can contribute to this, can never alone supply it.

Thirdly the work of the hospitals has benefited. There is no doubt that the ubiquitous presence of intelligent, alert, usually very critical medical students watching everything as we do, listening to everything we say, watching the reactions of our patients and their relatives, is a major factor in maintaining the quality of clinical practice. I for one would rather be seriously ill in a British teaching hospital than in any other hospital in the world.

There is a fourth advantage, hidden but important to the university. The system is much cheaper than running a university hospital.

The Disadvantages of University Clinical Units

Wherever university clinical units have been established there has been conflict, misunderstanding and resentment of varying degrees in three areas.

First, the physicians and surgeons of the teaching hospitals (the N.H.S. staff since 1948) have understandably been jealous of the university clinical units which have had, or used to have, more medical staff, more junior staff, more technicians, more secretaries, better laboratory facilities and better research opportunities than did N.H.S. units. Their staff had greater opportunity to achieve professional fame and more likeihood of appointment to national committees, although that is a dubious virtue.

Secondly, the staff of university clinical units have often felt they were not received as generously as they should have been and that their hospital colleagues did not appreciate that:

1) They have to maintain a clinical service of the same standard as the rest of the hospital.

2) They have to take the brunt of routine systemic teaching in their discipline and usually have to organise clinical teaching, which may be no easy task these days with a yearly intake of 160 students and 500 clinical students on the campus at any one time.

3) They have a duty to the University of prosecuting research and often of training non-medical as well as medical graduates for Ph.D. or M.Sc. degrees.

4) They have the obligation of managing and budgeting for their unit—academic staff, technicians, animal house staff, work shop staff, secretaries, and of purchasing capital equipment and expendables—with a budget which in a big unit may exceed £100,000. This is a chore which very few of our N.H.S. clinical colleagues have to bear.

Thirdly, there is often friction between university clinical units and the rest of the University. I remember many years ago my uncle making a scathing comment about a local business man, scion, apparently, of a well known Cardiff family. According to uncle his parentage was doubtful, he had been brought up in bad company and although called a gentleman, the only justification for this title was that it allowed him to enter the appropriate public convenience. That sums

up neatly the view only too often held, if not expressed, by the rest of a university about its faculty of medicine and especially its clinical units. To them the medical faculty is of doubtful scientific heritage, its occupation sordid, its education lacking in true scholarship and, worst of all, its clinical units expensive.

The medical faculty frequently finds that its problems are not understood by the rest of the university, and indeed it sometimes pays to keep it that way! The lack of insight of the other faculties would not matter except that the medical faculty has to fight it out with them to get its share of the U.G.C. money.

Despite these diffculties, the university clinical units, this remarkable innovation of the Haldane Commission, have made a major contribution to medical education in Britain, and also to medicine, for when they were first established these units did much to bring modern scientific methods to clinical medicine.

The Future of the University Clinical Units

Changes that have occurred in recent years

As I see it a number of important changes have occurred in the last thirty years.

1. The number of medical students has increased: instead of 60 it is now 160 or more who enter each medical school yearly.

2. The number of departments and specialities in a medical school and its teaching hospital—university departments and non-university departments—has increased. There may be 10 to 12 non-clinical departments (Table II) usually university departments and 15 to 20 clinical departments some

Table II

MEDICAL SCHOOL DEPARTMENTS
NON-CLINICAL

Anatomy	Social Medicine
Physiology	Genetics
Clinical Physiology	Medical Statistics
Biochemistry	Biophysics
Pathology	Cancer Research
Pharmacology	Neuropathology

university, some N.H.S. (Table III). All these departments are of course fighting to participate in teaching the class of 160 students. All of them from anaesthetics to venereology, feel that they have something of unique importance to offer the undergraduate. All of them are terrified that if they do not teach the students they will not recruit in their discipline in future. Many are worried that if they do not have a large "staff student contact time" they will not receive adequate grants from the U.G.C.

3. It is increasingly difficult to distinguish the university clinical units and the N.H.S. clinical units. The medical staff of both are now well versed in scientific method and they all strive not only to practice medicine but to

TABLE III

MEDICAL SCHOOL DEPARTMENTS
CLINICAL — N. H. S. AND UNIVERSITY

Medicine	Paediatrics
Therapeutics	Geriatrics
Neurology	Obstetrics & Gynaecology
Cardiology	Surgery
Gastroenterolog	Orthopaedics
Nuclear Medicine	Ophthalmology
Venereology	E.N.T.
Endocrinology	Radiotherapy
Anaesthetics	Neurosurgery
Industrial Health	General Practice
Dermatology	Psychiatry

advance it. I know that in Birmingham I am proud to have around me N.H.S. staff whose work and research is of international repute. The same happy state of affairs is true here in Belfast.

4. All major hospitals have become teaching hospitals. They teach their own junior staff. They make a major contribution to graduate education and, in Birmingham, they take our senior students as student house officers and give them excellent clinical experience.

5. Graduate education has been revolutionised. All graduates now have to work for a year in pre-registration house officers posts. Whatever career they wish to follow further training is demanded under the supervision of the Joint Committee for Higher Medical Training and its Specialist Advisory Committees.

The new requirements of medical education

It follows that the requirements of undergraduate medical education have changed. Medical faculties have paid lip service to this. They say that they do not now have to produce at graduation "the safe practising doctor" which was their aim in the nineteenth century. But their behaviour has not changed. It is still usual for students to be given a comprehensive but superficial and didactic training with transient contact with many if not most of the specialised departments shown in Tables II and III.

The aims of undergraduate education were well set out in the Todd Report 1968. They are to:

1. Demonstrate the application of science to medical practice.
2. Review modern knowledge of disease, its prevention and management.
3. Indicate future developments.

4. Give the student the opportunity to learn:
   Sound clinical methods
   The principals of treatment
   Correct attitudes to patients
   The ethics of medicine.

What the medical faculty now needs to do is to concentrate on principles. It is learning by students which matters not teaching—and our students need more time for reflection and discussion. More time needs to be given to criticising their thinking, their writing and their arguing. This is what is meant by university education. They should be learning in an environment of research. They do not all need the same comprehensive but superficial training. They need an opportunity to work in depth in a part of modern medicine and there is no reason why they should not be able to choose from a wide variety of options which the departments and specialities of a modern medical school and hospital are well able to offer.

The new organisation needed

I believe the faculty of medicine should take the control of undergraduate medical education away from Departments. It should be in the hands of a separate body— a School of Undergraduate Medical Education— with its own director and sub-directors who would be drawn in rotation from the staff of the various departments in the medical school. If I had to express any preference I would suggest as sub-directors a physiologist, a pathologist and a physician as being the three types of teachers whom I believe would build a medical education that was appropriate.

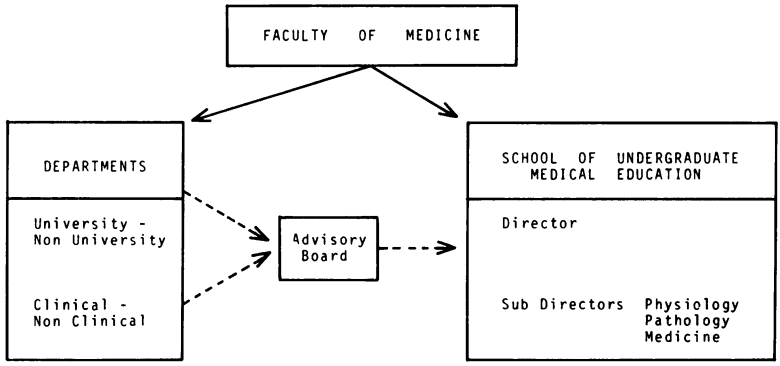
The new course needed

This school should organise a course which is unhurried, which ignores the primitive departmental wish to teach its own discipline, which gives ample time for self teaching and library work and which uses modern programmed learning techniques. This course must still give the student the clerking and dressing which Osler held in such high regard and, incidentally, in Birmingham now in the final year we have no systematic teaching at all but the clinical dressing and clerking of the earlier clinical years is supplemented by five ten-week periods of student house officerman-ship.

I would like to see less superficial didactic teaching. Instead every student should be given more opportunity to work in depth. I would like students to work in depth by taking optional courses. Each year a student might be expected to complete some 12-15 options, clinical, scientific, epidemiological or laboratory based. There should be a large range of options from which to choose. No two students would do the same options. Some might be big options, the neuroanatomy of the midbrain for one day a week for three terms. Some might be small: one day a week for one term on bone growth or controlled therapeutic trials, the social problems of the aged or the life and times of the gonococcus. A few options should be non-medical, such as 'The Twentieth Century Novel', 'Beethoven's symphonies' or 'The nonsense of Teilhard de Chardin'.

The new organisation of the faculty

If a course of this sort is to be organised not by departments but by a school of undergraduate medical education then the faculty would have to be reorganised as it is shown in the Figure.



The Future Duties of Departments

This brings me to the future of departments and especially of the university clinical units. I do not see these changing greatly but I see important changes in emphasis. Their duties would be threefold:

1. *Teaching*

a) They will contribute as requested by the School of Undergraduate Medicine in any common core course.

b) They will teach small groups of students who come to the department to do options. Here they will teach in depth and staff from more than one department may contribute to the option.

c) They will continue to train postgraduates and especially those who wish to prosecute research or intend to be teachers.

2. *Clinical Service*

This is essential for the staff of clinical units, like medical students, wish to be doctors. The clinical duties must however not be too extensive so that the other duties of these clinical units can be undertaken.

3. *Research*

Here it is important that university clinical units do not duplicate the sort of research which NHS units now do so well. I want to see the university clinical units making innovations and exploiting their unique position in the university in a way which we do not do at present.

a) By putting much more effort into interdisciplinary research such as:

Pharmacology/genetics
Biochemistry/cardiac muscle metabolism
Endocrinology/immunology

b) Even more important—and even more neglected—by putting effort into inter-faculty research. The present boundaries of the faculty structure of a university need to be breached to bring to bear on medical problems the expertise in other faculties: in chemistry, economics, physics, psychology, engineering, transportation.

My thesis is that university clinical departments would take on two new duties which are of the very essence of university life

1) Teaching and discussing current problems in depth with small groups of young men doing their options.

2) Developing a type of research which it is diffcult if not often impossible for NHS units in hospitals to initiate and which would exploit their unique position inside the university.

Conclusion

I have in this lecture looked back into the past at the development of medicine as a University discipline and at the relationships between a medical school and its teaching hospital. I did this so that we might together look at the development of university clinical units, their achievements, their difficulties and how they may develop in the future.

Whatever the future holds it is my conviction that the medical school must aim at the university ideal which is 'education in an environment of research'. Only if this is done can we train young people to handle not only the problems of today but the problems as yet unforseen of the morrow. This was the vision of Richard Burdon Haldane. You do not need to be the Secretary of State for War to have such a vision. Similar visions have been seen by those who served on the Good-enough Committee, and the Todd Commission. It is in my opinion time that we listened to a message that was first given 63 years ago.

Reference

Royal Commission (1910-1913) on University Education in London. Cd. 5911, 6717 and 6718. H.M.S.O. London.

'PRO TANTO QUID RETRIBUAMUS'

by

HUME LOGAN, M.B., M.Ch., F.R.C.S.(E), F.R.C.S.(Ed.)

based on

PRESIDENTIAL ADDRESS given to :

THE EASTERN DIVISION (N.I.) of the BRITISH MEDICAL ASSOCIATION

on the 25th September, 1975

THERE are three addresses given each autumn in Belfast—the Presidential addresses of the Ulster Medical Society and the Eastern Division of the British Medical Association and the opening address to the new clinical students of the Royal Victoria Hospital. The evolution of medicine in the Province has been the most common subject, yet medicine did not develop in Belfast on its own but in the environment of a developing city with its own medical and physical problems. The Ulster Hospital for Children, with several other hospitals, was founded in the second half of the nineteenth century during a period when the city was enjoying the fruits of its industry. Neither the foundation of the Ulster Hospital, its part in medical education, nor the people concerned with it can be studied in isolation, but must be put in the perspective of the development of the city, and the medical knowledge available to deal with the illnesses of the period. These are the objects and themes of this paper.

Sir Arthur Chichester was granted the patency of the town of Belfast in 1603. The population at the first census in 1659 was only 589. The town which was on the river Farset, allowed boats to come almost to the Castle door. During the seventeenth century the growth of the town was minimal and it was not until the end of the century that the linen industry started in the area. Like many things good or bad, it was William of Orange with whom we must really start and he promised to encourage the linen industry after the English parliament destroyed the woolen trade. He brought French Huguenots, fleeing after the renunciation of the Edict of Nantes, to Lisburn. During the next hundred years the industry flourished.

Another famous name then entered the plot—Robert Joy, a man of many parts—a man of vision—an entrepreneur—a philanthropist— an architect— a truly great man. Robert's father had acqquired a print shop in payment of a debt and he opened the Belfast Newsletter in it in 1737. With his brother Henry. Robert not only ran the newspaper but also a paper mill at the end of Joy Street. It was Robert who drew the plans for Clifton House and took a life-long interest in the charity, paying his last visit there in a sedan chair when he was unable to walk. He went on a tour of Scotland in 1777 where he was impressed by the new cotton spinning machinery invented by Hargreaves and Arkwright. On his return to Belfast he set up in partnership with Thomas McCabe, a watchmaker and jeweller, and they hired accommodation from the Charitable Society in Clifton House, solving their labour problems by the employment of children from the Society. Despite these innovations the cotton industry did not

really expand until after the Act of Union and by 1806 there were 2,000 people weaving cotton out of a population of 22,000 and virtually no linen was being woven. The problems of spinning flax by power had been solved in 1788 in England but the yarns produced were only suitable for weaving coarse fabrics, while Irish linen was fine and therefore the English competition did not really matter. In 1825 a process was developed whereby fine yarns could be machine spun and annihilation of the Irish linen industry looked imminent. The challenge was taken up, especially as the cotton spinning competition of England and Scotland was strong, and the cotton industry of Belfast was replaced by that of mechanical flax spinning. Over half the export of Irish linen was from Belfast and by 1835 it had become Ireland's first port. This, of course, was one of the factors which brought about our shipbuilding industry.

Between the points where the Farset which flowed into the Lagan at the end of High Street and the Blackstaff a little further south there was a tongue of dry land through the mud flats. Opposite this at low tide it was possible to wade across the Lagan to the Co. Down side and at this site the Long Bridge was built in the 1680's. If one stood on this bridge in the 1830's the site was very different from to-day. The shallow water of the Lagan meandered out to sea reaching the deep water at Garmoyle Pool three miles away. It was here that the large vessels anchored and lighters carried the cargo up to the quays. In 1785 the "Corporation for Preserving and Improving the Port and Harbour of Belfast" was set up. It was popularly known as the "Ballast Board" and later as the Harbour Commissioners. Nothing very much happened until 1839, when a deep channel was made for the Lagan, cutting off one of its bends. The material excavated from the channel was banked up—on the left side for reclamation along the town shore and on the right to form Dargans Island later called Queen's Island. Simultaneously the river was deepened from the Long Bridge to the new channel and in 1849 a further channel was opened which allowed large ships to sail up to the town quays.

The first shipbuilder of any consequence in Belfast was William Ritchie who came from Ayrshire in 1791 and built wooden boats on the Antrim side. The first firm to open on Queen's Island was that of Thompson and Kirwan in 1851, but this company does not seem to have prospered. At the same time Robert Hickson started the Belfast Iron Works in Eliza Street. He made boiler plates but these could be made cheaper in England, so he sought a new outlet for his iron plating. He turned to shipbuilding and took over a site on Queen's Island, employing Robert Harland as his manager. Harland bought him over in 1858 for £5,000 getting their money from the uncle of his partner, E. W. Wolff. By the middle of the nineteenth century Belfast had a thriving linen industry and shipbuilding, and great physical changes were taking place in the port and the town in general. At this time there was one hospital in Belfast. It had started as a dispensary in the Charitable Society building in 1792. Flourishing for a few years it went through a bad period and consequently fell into debt and was almost abandoned. However, in 1797 public interest revived and a house was rented in Factory Row (now Berry Street). Malcolm records this as being the first fever hospital in Ireland, but in fact one had opened in Limerick seventeen years earlier.

Again the Dispensary and Fever Hospital fell on hard times, perhaps as a result of the political and economic troubles of the time. After being closed for two years the Dispensary took over three houses in West Street at the corner of Smithfield. Despite many trials and tribulations the charity succeeded and went from strength to strength and ultimately moved into a purpose-built hospital in Frederick Street in 1817. One hundred and sixty years later this hospital has progressed to become our main teaching hospital, the Royal Victoria Hospital.

One of the founders and the man who did so much to keep the original dispensary going through its formative years was James McDonnell, one of the McDonnells of the Glens who was born in 1762 near Cushendall. He qualified in Edinburgh at the age of twenty-two and wrote a thesis "On the Drowned" in which he discussed methods of resuscitation, including as a last resort, blood transfusion. Settling in Belfast he not only built up a large practice but also a valuable library. He was one of the greats of his time. Not only was he the premier doctor of Belfast and its environs, but he obviously had foresight and tenacity. His fight for his hospital did not always make him popular with his colleagues and Malcolm said of him "whether we view Dr. McDonnell as a philantropist, a scholar or a physician, we cannot but award him the highest place amongst the memorable of the land". He must have been strong physically as well as mentally as he used regularly to visit his mother in Cushendun once a fortnight. He left Belfast at midnight, found a fresh horse at Glenarm, rested while he talked to his mother and then rode back to Belfast, one hundred and twenty miles on horseback in twenty-four hours. With a constitution like that it is no wonder that he lived to the ripe old age of eighty-two.

Three years after opening in Frederick Street a resolution was passed that "The Physicians and Surgeons of Belfast should be invited to place pupils in the General Hospital to acquire experience by observing its practice and in the course of a few years, it might become a school of Physic and Surgery of no trifling importance to the young medical students of this neighbourhood". Walter W. Bingham, of Dundonald, became the first registered pupil on the 21st December, 1821.

In 1826 Professor Drumond wrote to the Belfast News Letter suggesting various lectures in materia medica etc., should be arranged and also clinical lectures in the Fever Hospital, but the staff of the hospital rejected Drummond's suggestion. The matter was not turned down completely as they stated that if it was deemed advisable, lectures might be undertaken and a year later on the 3rd June, Dr. James McDonnell gave the first clinical lecture.

Three years after this the establishment of a medical faculty at Inst. was suggested, but it was five years before this was agreed. Therefore it was not until 1837, with formal teaching at Inst. and clinical teaching at the General Hospital, that the Belfast Medical school was recognised for the diploma of many of the Royal Colleges and medical degrees of the University of London. Even at this time part of the studies were probably done outside Belfast as students were not admitted to the Lying-in Hospital in Clifton Street until 1853, although permission for them to attend was granted in 1851. The students were housed in Upper

Townsend Street and when a patient went into labour a white card was placed in the labour ward window, a boy being employed to watch the window and warn them—the fee apparently being sixpence.

The next development in the medical school was the opening of Queen's College in 1849. Not all the students moved to Malone as there was no building for anatomy in the new site. This subject had been taught at Inst. before there was a medical faculty there. Of course the supply of bodies for dissection was a problem there as it was in Dublin. When the College of Surgeons purchased new premises in Mercer Street in 1787 they also had to buy an adjoining house to gain entrance to Goat Alley (now Digges' Lane). This was a passage through which bodies could be discreetly brought to the dissecting room in the college. Secrecy was important as the bodies were purchased from resurrectionists who raided the graves of the poor. Their technique was to expose the head end of the coffin and, by means of a special lever, break open the top part and remove the body which was then stripped and the clothes replaced. The law at this time judged stealing the clothes as a felony punishable by hanging or transportation, whilst body snatching was only a misdemeanor worthy of less stringent measures. In 1829/30 the price of bodies varied from ten to twenty-five shillings in Dublin, while in England they fetched £10—£20 and consequently an export business developed. Relatives often guarded graves till the bodies decomposed or paid guards to do this, but the latter were inclined, for a suitable sum to turn a blind eye. As business increased the raiding parties began to use arms and this, together with the exposure of Burke and Hare, brought about the act which allowed unclaimed bodies to be taken from the Poor Law Unions, and a more reliable and more ethical supply of bodies was made available. Even this supply to Inst. was suspended by the Union Workhouse for a time in 1863 as the Board of Guardians found it objectionable and the dissecting room was thought to be a source of infection in the town.

One of the pupils at Inst. at this time was Andrew George Malcolm who was to become one of the giants of the profession in Belfast. He was born in Newry in 1818, the son of a clergyman. After graduating in Edinburgh in 1842, when he obtained the gold medal for his thesis on 'Fever', he joined the staff of the General Hospital, and in 1853 started the Clinical and Pathological Society of which he became president three years later. Dr. R. H. Hunter stated that Malcolm did more for the advancement of science in Belfast than any other man of his time and that he was a true reformer and missionary. When Malcolm died of 'disease of the heart' at the age of thirty-seven, the News Letter suggested that a statue should be erected "within the palings" of the General Hospital in his memory. The statue was never erected, but his widow founded the Malcolm Exhibition which is still competed for by fourth year students in medicine and surgery.

Malcolm wrote the history of the General Hospital in 1851, but of more practical importance was a paper which he read before the statistical section of the British Association in 1852 entitled "The sanitary state of Belfast, with suggestions for its improvement". He started by describing the sewers of the city and pointed out that they opened into the Lagan. At high tide the solid effluent was unable to

escape and therefore for some hours afterwards the sewers were effectively blocked and consequently "the lowest part of the level district becomes inundated, and the residents suffer directly and immediately in health and property and long after from the humidity which remains'. At this time upwards of 1800 houses were accessible only by a covered archway, the majority having only one outlet. Comparatively few had piped water the rest being supplied either from public fountains, pumps sunk by landlords or by water carts. The main thoroughfares were clean in that all vegetable and animal remains were removed, but 'in the poorer localities, where the accumulation of offensive remains is the greatest, we must confess there is a lamentable deficiency'. In 1848, 180 thoroughfares were unpaved. Upwards of 3,000 houses were without yards of any description and a much larger number of the poorer houses were "deficient in still more necessary accommodation". The typical house had four rooms on two storeys. generally occupied by two families. The rooms varied from 7—10 feet square. "Such a house is manifestly insufficient to be the domicile of ten individuals; but we have now, and not infrequently so, as many as eighteen or even twenty persons sleeping within such limited apartments". It is no wonder that disease was rife, especially fevers in such confined and overcrowded quarters. In 1855 when the wages in the linen trade were well under £1 per week, the average age of death was nine, half the living population was under the age of twenty and the infant mortality rate was around 150 per 1,000.

In the years 1847/48 nearly 15,000 were struck down by dysentry and fever and 2,500 people died. A Sanitary Committee was set up at this time under Malcolm, introducing many new measures, but its main contribution was the anticipation of the arrival of the cholera which was expected to sweep the country for the second time. The first epidemic had been in 1832, and Malcolm gave a detailed account of it in his "History of the General Hospital". It makes extraordinary reading. Crossing the Russian border in 1830, Asiatic cholera—"the death winged enemy" slowly crossed Europe, reaching Sunderland in October, 1831 and Belfast in February 1832. In anticipation the streets and houses were scrupulously cleaned and it was decided to isolate the victims and their families. Cholera wards were quickly erected at the Fever Hospital and a building in Lancaster Street was rented to house the contacts. Bernard Murtagh, a cooper, was Belfast's first case—his symptoms were complete collapse and he died nineteen hours after the onset. The epidemic lasted forty-six weeks, the mortality was 16 per cent and the black draped cholera cart with its bell ringing warning the people to bring out their dead was an all too common sight in the town. The general panic was such that the people were afraid of being buried alive as it was very important to remove the infected corpses immediately.

The second epidemic occurred in 1849 and while 5 per cent of the population was affected in the first wave only 3 per cent were affected in the second. In total numbers there was not a great difference as the population had grown considerably. Perhaps it was more significant that in 1847 there was an outbreak of typhus. While this was always a slumbering plague in overcrowded conditions, its origin in this case was interesting. The Swatara was an imigrant ship which sailed from Liverpool but was beaten back by bad weather at the same time as typhus first

appeared on board. The ship put into Belfast and the sick were taken to the General Hospital. Setting out again the captain was obliged to put into Derry because of the spread of the disease amongst the passengers. After sailing yet again the ship was once more forced to go back into Belfast with a large porportion of the passengers attacked. The disease was by now spreading through the town and more fever beds were urgently required. The Union Infirmary was enlarged by nearly ninety beds, a shed was built in the grounds of the General Hospital, all the old cholera buildings were filled with patients and the College Hospital was opened in Barrack Street. Fifty cases per day were being admitted early in the epidemic rising to nearly one hundred per day in July. Over 2,000 victims were in hospital at one time and tents had to be erected to house the convalescent patients. The total number of admissions was 13,600—one out of every five persons being attacked.

Fever was not the only pestilence, there was the added complication of the failure of the potato crops in the mid 1840's. Famines were not very uncommon in Ireland and basically were brought about by the low standard of economic life of the people most of whom lived only one season ahead of starvation. Such a state ended in England at the end of the fourteenth century with the introduction of new root crops which allowed the cattle to be fed throughout the winter, instead of being killed off in large numbers as before and consequently a lean year could be overcome. This was not the case in Ireland where penal enactments, wars, confiscations and over-population had depressed the economic standards of the peasants. The potato was their staple diet because it was easily cultivated and more important, it was cheap and nearly three million came to be dependant upon it for their existence. The economic plight of these people was such that they could not lay in supplies to carry them over the bad times and when it arrived there was chaos. One season of cold and wet weather caused distress, two consecutive bad seasons meant disaster—a famine. On the other hand wet and warm conditions allow profuse growth of *Phytohyhora infestans* or potato blight. There was sporadic blight in 1845 but the spring of 1846 was hot and damp and the blight broke out with a vengence. By the winter of 1846/7 famine was rife. The people became apathetic and crowded together in large numbers to keep warm—the conditions most suitable for the body louse to thrive and pass from subject to subject—endemic typhus became epidemic and this was accompanied by relapsing fever. The loss of the potato from the diet also meant the loss of vitamin C and scurvy was an added complication. Furthermore, dysentery, Ruith Fola or bloody flux was another sequela of famine and while there were only 1800 cases in Belfast the mortality was 32 per cent. Dr. Seaton Reid described the epidemic as lasting two years (1846/8) being introduced at a time of plenty in the town by fugitives from elsewhere. It is staggering to think that in Ireland probably one million people died.

In Belfast by the mid-nineteenth century there was increasing industrial expansion with a thriving linen industry and an expanding shipbuilding industry. These provided work for the people who flocked to the town. They had to be housed and fed and some attempt had to be made to look after them medically. The General Hospital was still the main hospital in the mid-century, although there was an

infirmary at the Union. As the population of the city grew over the next twenty-five years other hospitals were to open. There is no very obvious reason why philantrophy should have been so delayed but up till this time no provision had been made for the specialised treatment of children, then two hospitals were opened within a short time.

Th Ulster Hospital for Children first opened its door in the summer of 1873, at 12 Chichester Street, the present site being McAfee's Shoe Shop. Its founder was Dr. John Martin who was born in 1839, the son of a general practitioner in Newtownards. He attended classes in Medicine at the Andersonian Institute in Glasgow and obtained his licence at the Royal College of Surgeons in December, 1858 at the age of nineteen and immediately became the dispensary doctor to Fivemiletown. The only record about his period there was that he paid an annual rent of £7.11.8d recorded in a rent book of that time. In 1868 he qualified as a Licentitate of the King's and Queen's College of Physicians—now the Royal College of Physicians in Ireland. Shortly after this he returned to Belfast having been appointed apothecary to the Barrack Street Dispensary—one of the most important dispensaries in the town, and after two years became its medical officer. He held this post for sixteen years and during this time he lived at 9 Clarence Place. Next door in number 11, lived his brother-in-law, Dr. Henry Whittaker, who was not only Belfast's first Medical Officer of Health, but first co-secretary of the Ulster Medical Society and also its President in 1892/3. The wives of both these men were on the Ladies Committee of the Ulster Hospital. They were the daughters of Mr. Francis Glenfield, a soap and candle manufacturer in York Street.

Dr. John Martin seems to have been of above average ability and enjoyed an extensive practice. A religious man, he was a member of St. Anne's Church and in his will stated "my express wish is that my eldest son shall be brought up to the church (Church of Ireland preferred)". Judging by the criteria he laid down for the education of his children and his bequests he must have been reasonably well off and his obituary notice in the Belfast News Letter after his death in 1884 stated that he was a large shareholder in the Belfast, Holywood and Bangor Railway, in the affairs of which he took an active interest. Apart from being a Conservative, little more is recorded about the man who recognised the need to found a children's hospital. There is no reference to the Ulster Hospital in his obituary, perhaps he was out of favour having resigned from the Ulster Staff and the Management Committee in 1881, when he opposed the opening of beds for gynaecology and obstetrics. By this time the Hospital had moved to Fisherwick Place where the A.B.C. Cinema now stands and the nineth annual report in 1882 of the hospital stated that the new beds were opened primarily to meet the requirements of the Royal University of Ireland. For his degree, a student had to produce a certificate given by a hospital recognised by the Royal University, to show that he had received clinical instruction in midwifery and in the special diseases of women and children in addition to the certificate of clinical instruction in general diseases. At this time there were four beds for the diseases of women in the General Hospital and so the opening of more beds in the Ulster was important—in fact in 1883/4, forty-six patients were treated as in-patients and 803

as out-patients. Furthermore, twenty-eight students attended clinical lectures at the hospital. As far as can be ascertained from the annual reports, the obstetrical side was of a purely domiciliary nature. The medical assistants under the supervision of the staff located themselves in the different parts of the town where their services were most required. Another stipulation of the University of Ireland was that there should be a Professor of Obstetrics and Professor Dill joined the staff. He was a member of the same family as General Sir John Dill, Chief of the Imperial Staff during the last war. Born in Castlefin,Co. Donegal, he qualified in Glasgow and was at one time associated with James Young Simpson of chloroform fame. He was unique in that not only was he Professor of Midwifery but he was also the city coroner. He had joined the Lying-in Hospital in 1853 being elected to the staff two years later. He was not subsequently re-elected, and while the reason for the Ladies Committee's decision is not known, he was later described as "combative and at times pugnacious, but was essentially kindhearted". Of course, this was a hospital run by ladies, for ladies and curiously enough founded by a lady —Mrs.Martha McTier. This lady's maiden name was Drennan, sister of Dr. William Drennan who was one of the founders of the United Irishmen of which he was president for two years. It was Drennan who first coined the famous soubriquet "the emerald isle". Drennan was tried for sedition in 1794 and acquitted. Malcolm wrote after his death, at the age of 66, "A patriot in the truest sense. A man of the highest integrity, and splendid talents, not even his enemies could conceal their admiration of his genius and character". Drennan should also be remembered as one of the founders of the Belfast Academical Institution in 1810.

It was in Fisherwick Place that surgery really started in the Ulster Hospital, facilitated by the introduction of anaesthesia twenty years earlier in America. It was first used in Ireland on New Year's Day 1847 by John McDonnell to amputate an arm which had gone septic as a result of a thorn prick. John, was the son of our own famous James McDonnell.

The art of surgery as it certainly was then, was no longer practised by barbers but by men who had studied anatomy, physiology and pathology. We are talking of the time of Dupytren, Cooper, Colles, Syme and Lister. Of course it is Lister who gets all the credit for antiseptic surgery although he was not the first to use it. He states "in the year 1863 I was much struck with the account of the remarkable effects produced by carbolic acid upon the sewage of Carlisle" and it was on this observation that he based his studies. Therefore by the time the Ulster Hospital opened, surgery could be performed painlessly and with a much greater degree of safety than was hitherto possible. When we consider the size of the Chichester Street premises and the income of the hospital it is not surprising that in the second annual report we find "the committee have not thought it desirable to set apart an operating room nor incur the expense of instruments and appliances . . . ." Yet a year later we find it recorded that "several major and numerous minor operations have been performed". By the time the hospital moved to Fisherwick Place we find Dr. Esler reporting "of those admitted a large proportion were surgical cases requiring operative interference". He acknowledged the timely supply of surgical instruments lately added to the operating room, and ex-

pressed the satisfaction of the Medical Staff with "the accommodation afforded by the present premises, which are found to be ample and convenient". In the following year he reported that "many of these patients requiring a lengthened attendance, having been admitted for surgical operations". In 1887 the first two ovariotomies were performed, both being successful, and in the following year a hysterectomy was performed and "an airy room was specially fitted-out for abdominal and other serious operation cases". This allowed an increase in the number of operations and by 1890 thirty-five operations were performed with anaesthetics being given twenty times and "in none was there subsequent surgical fever".

In the staff meeting minutes for May, 1889 we read of the trouble which these operations caused. The Lady Superintendent wrote to the General Committee complaining of the inconvenience caused when grave operations were performed in the gynaecological department. Firstly, the Extern Children's Department was inconvenienced because the beds from the Gynaecological ward were moved there. Scondly, the store room was closed, and therefore blankets, pillows etc. had to lie about the wards 'causing much untidiness' and two of the nurses had to sleep out during the time the case occupied the ward. Thirdly, owing to the lower bathroom not being used all the slops had to be carried to the bathroom on the same landing where the nurses and servants slept. As would have happened today the staff first debated the propriety of the Lady Superintendent in not having first placed the report before the Medical Staff Committee. At their next meeting they replied to the report stating that these operations must be performed and making some suggestions to change the arrangement to facilitate the Lady Superintendent.

It was such understanding and co-operation which led to the Ulster Hospital of today. We still get opposition when initiating new techniques, but the obstacles seem trivial to those of our great predecessors. We are fortunate to be members of this great medical profession—a profession which faces considerable problems at present. Our city has supported us in the past and although it too faces great difficulties at present, we know that out of adversity comes greatness. The motto of the city is' Pro Tanto Quid Retribuamus'—for so much what shall we return. It is up to us, to ensure that the future is as great as the past. Let us hope that in one hundred years someone can look back with the same pride as we do today. 'Pro Tanto Quid Retribuamus'.

I wish to acknowledge the help given to me in preparing this paper by Mr. Vitty of the Linenhall Library, Miss Hamilton of the Public Records Office, Mr. N. Nesbit of the Belfast Museum, Dr. R. W. M. Strain, many colleagues who lent me books and gave valuable advice and Miss L. Gribben who typed the manuscript.

PRESCRIBING IN NORTHERN IRELAND

STUDY No. 1

SLEEPING TABLETS

by

P. C. ELMES, HELEN HOOD, CAROL McMEEKIN and O. L. WADE

from

The Department of Therapeutics and Pharmacology, Queen's University, Belfast, and the Department of Therapeutics and Clinical Pharmacology, University of Birmingham

THE use of sleeping tablets has recently been the subject of much discussion and controversy. Criticism of their use has been based on doubts about their value and their adverse reactions.

The value of hypnotics

The value of all medication for sleep has been called into question. Although current research is adding to our knowledge of what happens to the brain, the circulation and the endocrine system during sleep, we are ignorant of how much sleep is needed and what processes need to go on during sleep. There is evidence (Oswald 1973) that hypnotics interfere with the physiological features of normal sleep and that their effects on the performance of skilled tasks persist during the following day and possibly for several days. It has been shown that some patients who take a hypnotic at night are abnormally restless in the early hours of the following morning and that nocturnal restlessness is common for many nights after stopping sleeping tablets after more than a few days of regular use. This restlessness may convince patients, and doctors, that medication should be restarted and is a major factor in perpetuating the use of hypnotics.

The adverse reactions of hypnotics

Barbiturates which were the choice in 80 per cent of prescriptions written for hypnotics fifteen years ago, have been the subject of critical comment in recent years (B.M.J. Leading Article, 1975: Wells, 1975). They may lead to dependence and they can cause serious withdrawal symptoms. They have in some parts of the United Kingdom become drugs of abuse, popular with teenagers and those who wish to potentiate the effects of alcohol. They have become commonly used drugs for self poisoning either to draw attention to distress or to commit suicide. Because of the evidence of their misuse the Campaign for the Use and Restriction of Barbiturates (C.U.R.B.) was launched in 1975 to reduce the prescribing and availability of barbiturates. Barbiturates have also been criticised, although other hypnotics are probably just as bad, because in elderly patients with reduced cerebral reserves, they often cause confusion at night and unsteadiness and drowsiness the following day. They are potent inducers of hepatic enzymes and interfere with the metabolism of many drugs, especially the anticoagulants.

It has been widely recommended that other hypnotics should be substituted for the barbiturates. Of those currently available the benzodiazepines seem the best: they do not induce hepatic enzymes, are not so liable to cause serious dependence and are seldom dangerous in overdose. However, even nitrazepam (Mogadon) has not been in use long enough to assess its disadvantages when widely used in a community. Chloral and its derivatives (Noctec, Tricloryl, Welldorm) all induce hepatic enzymes and are gastric irritants causing dyspepsia. Methaqualone, either alone (Melsedin, Revonal) or in combination with diphenhydramine (Mandrax) also induces hepatic enzymes. Moreover, Mandrax has been widely misused, and overdose, especially if combined with alcohol, is dangerous and often difficult to treat. Glutethimide (Doriden) another enzyme inducer, occasionally causes neuropathy. All the evidence suggests that all hypnotics, not only the barbiturates, should be used with greater caution.

The prescribing of hypnotics in Northern Ireland

The prescribing of hypnotics in Northern Ireland has been under surveillance since 1966. The drugs that are prescribed are listed in Table 1 with their "agreed

Table 1

Agreed daily doses for sleeping tablets

Approved name	*Commonly used proprietary names*	*Agreed daily doses*
1. Barbiturate		
a) Amylobarbitone	Amytal Mylomide	100 mg.
b) Butobarbitone	Soneryl	100 mg.
c) Cyclobarbitone	Rapidal Phanodorm	200 mg.
d) Heptabarbitone	Medomin	200 mg.
e) Methylphenobarbitone	Prominal	100 mg.
f) Pentobarbitone	Nembutal	100 mg.
g) Quinalbarbitone	Seconal	100 mg.
2. Barbiturate Mixtures		
a) Amylobarbitone and Quinalbarbitone	Tuinal	200 mg. tablet
b) Quinalbarbitone, Butobarbitone, Phenobarbitone	Ethobral	1 tablet
3. Non-Barbiturates		
a) Chloral	Noctec Somnos	1.0 g.
b) Dichloralphenazone	Welldorm Paedo-sed	1.3 g.
c) Triclofos	Tricloryl	1.0 g.
d) Glutethimide	Doriden	250 mg.
e) Methaqualone	Melsed	150 mg.
	Quaalude	150 mg.
(+ diphenhydramine)	Mandrax	1 tablet
f) Nitrazepam	Mogadon	5 mg.

daily doses". Details of the methods used in the survey and the basis on which daily doses of drugs are agreed are given in the first paper of this series (Elmes, Hood and Wade, 1976).

Hypnotics were prescribed at a rate of 30 daily doses/1,000 persons on doctors lists/day in 1966 (Fig. 1). This rate rose sharply between 1966 and 1969 to 42.7

FIG. 1

Changes in the Prescribing of Sleeping Tablets in Northern Ireland 1966 – 1974

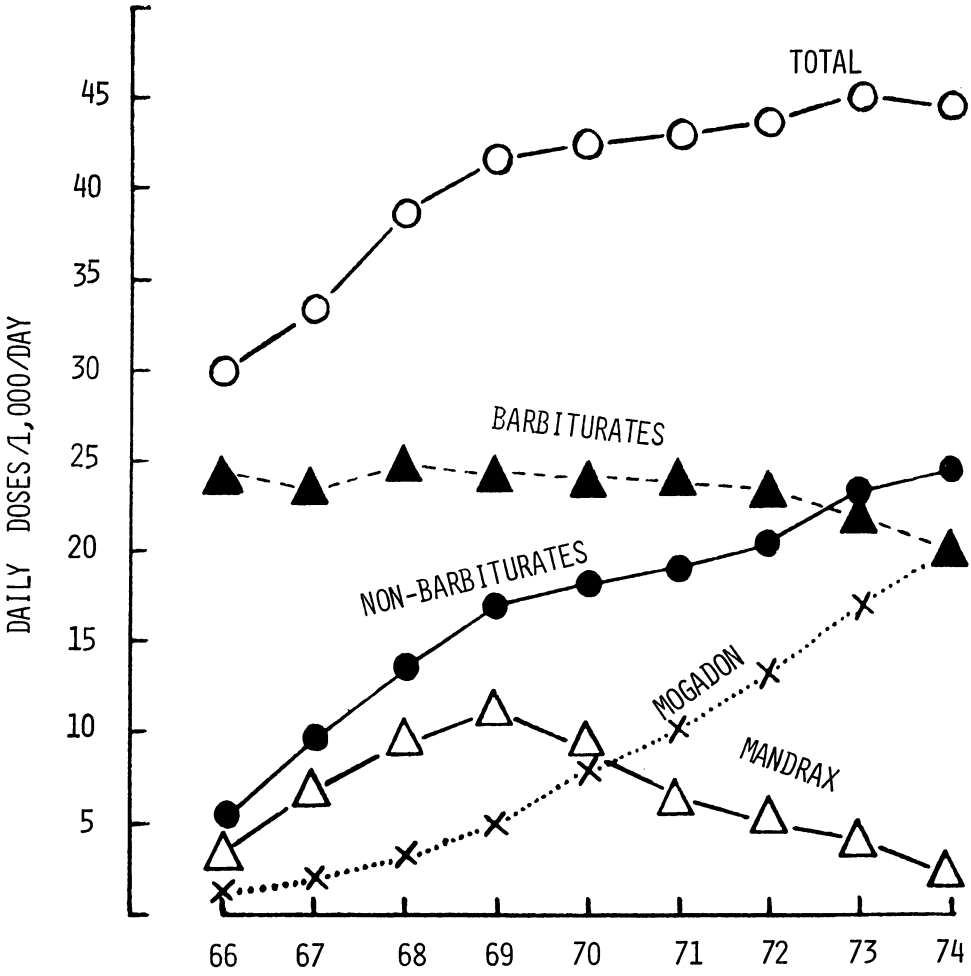


FIG. 1. *The rise in total prescribing was most rapid between* 1966 *and* 1969 *and has slowed down since then. The changes in the two most commonly prescribed non-barbiturate sleeping tablets introduced in the early* 1960s *are also shown.*

daily doses/1,000/day. Since that time it has remained fairly constant and in the second quarter of 1974, doctors prescribed on the average 44.3 daily doses of

hypnotics per 1,000 persons/day. Unfortunately, it is not possible to relate the prescribing of these drugs to the age of patients, but assuming that hypnotics are seldom prescribed for children under 15 the data suggest that during the late 1960's and early 1970's about one in every 15 adults was being prescribed sleeping tablets. The prescribing was above the average for the province in Belfast (59

FIG. 2

Prescribing of Sleeping Tablets in General Practice
Second Quarter 1973
(*Daily Doses*/1,000 *Population*/*Day*)

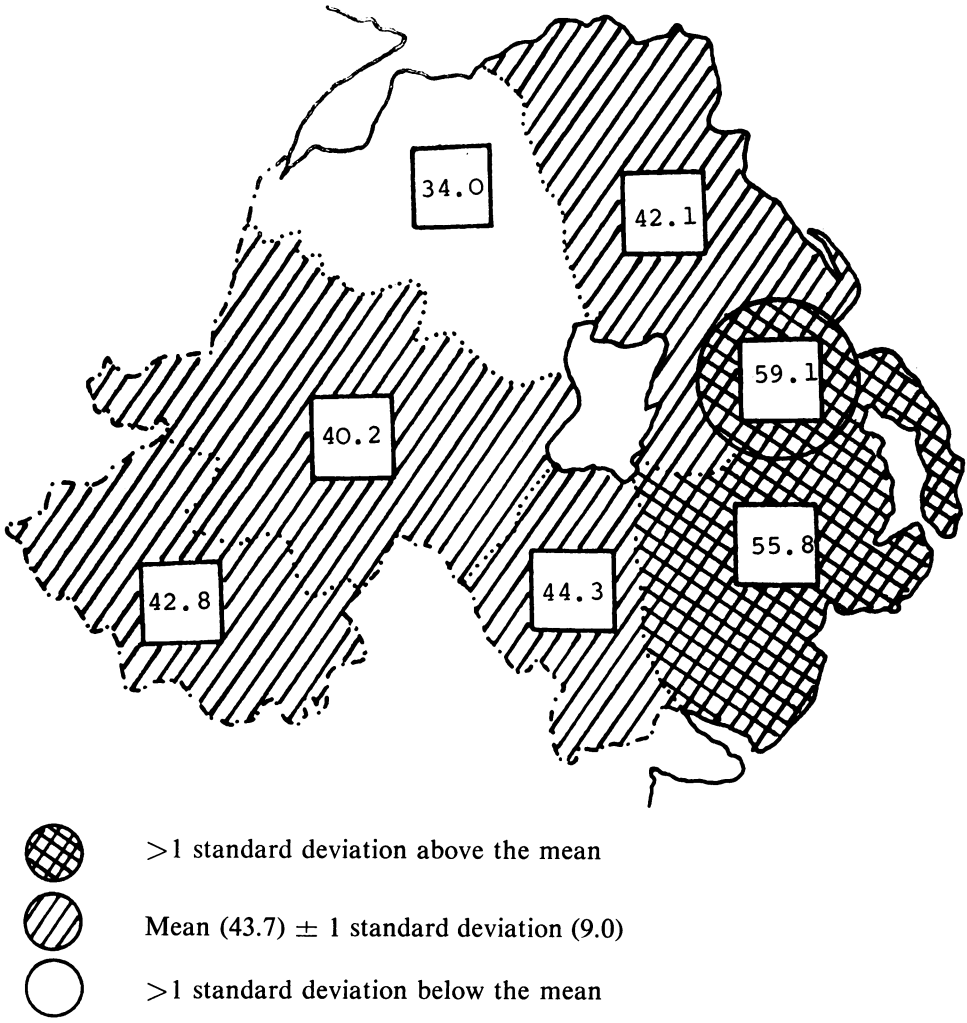


FIG. 2. *The highest prescribing* (59.1/*daily doses*/1,000 *day*) *is in Belfast and neighbouring Co. Down and the lowest is in Co. Londonderry.*

daily doses/1,000/day) and County Down (56 daily doses/1,000/day) and below the average in County Londonderry (34 daily doses/1,000/day) and the City of Londonderry (31 daily doses/1,000/day) (Fig. 2).

Although the use of hypnotics has increased since 1966, the geographical distribution of high and low prescribing has remained constant and the prescribing of hypnotics has not been related either temporarily or geographically to the level of civil strife which broke out in 1969 and has persisted sporadically in some areas of Northern Ireland ever since. In 1973 a reorganisation of the health services took place and data on the prescribing of hypnotics in 1974 is available for the new Health Services Districts. The variations in prescribing between these 17 districts (Table 2) are greater than was found between the previous counties and

TABLE 2

Prescribing of Hypnotics in Northern Ireland by Health Services Districts – 1974

Area	*Daily doses/1000/day*
East Belfast	52.7
North and West Belfast	48.4
South Belfast	76.6
Down	36.6
Lisburn	47.1
North Down and Ards	57.7
Ballymena and Antrim	27.3
Coleraine, Ballymoney and Moyle	29.4
Larne and Carrickfergus	32.0
Magherafelt and Cookstown	28.4
Newtownabbey	26.8
Craigavon and Banbridge	36.7
Dungannon and Armagh	32.2
Newry and Mourne	41.4
Fermanagh	23.5
Londonderry, Limavady and Strabane	24.7
Omagh	34.7
Northern Ireland Average	40.4

county boroughs (Fig. 2). The highest prescribing of hypnotics in 1974 was in South Belfast, 76.6 daily doses/1,000/day and the adjacent part of County Down (Bangor, Holywood and Newtownards District) 57.7 daily doses/1,000/day. The lowest was in Fermanagh 23.5 daily doses/1,000/day, but the Londonderry, Limavady, Strabane District and the Newtownabbey District were almost as low.

The hypnotics prescribed

The rate of prescribing of barbiturates was 24 daily doses/1,000/day in 1966 and it represented more than 80 per cent of hypnotic prescribing (Fig. 1). Despite the greater increase in the prescribing of hypnotics since 1966, the prescribing of barbiturates has decreased to 20 daily doses/1,000/day in 1974 and it now constitutes only 45 per cent of all hypnotic prescribing.

The increase in the prescribing of hypnotics between 1966 and 1969 coincided with the introduction and vigorous promotion of two new proprietary preparations, Mandrax and Mogadon (Fig. 1). At first Mandrax was the most popular of these two preparations, but reports of its misuse in combination with alcohol by young people led to a reduction in prescribing after 1969. By 1974 the rate was only 2 daily doses/1,000/day. It is not known whether the prescriptions written for Mandrax in 1974 are for a residue of patients originally given the drug in the 1960's when it was popular, or whether it is still being prescribed for the first time for some patients by doctors who consider the effectiveness of this preparation outweighs its disadvantages.

Mogadon was used less than Mandrax at first but the rate of prescribing of this drug has increased and is still increasing so that in 1974, it equalled that of all the barbiturates, 20 daily doses/1,000/day. This increased prescribing of Mogadon has probably been partly due to the adverse publicity given first to Mandrax and now to the barbiturates.

Although the prescribing of hypnotics varies very greatly from county to county (Fig. 2), the increase in the use of Mogadon and the decrease in the use of barbiturates has occurred in all areas, both where the prescribing of hypnotics was high as in Belfast or low as in Londonderry.

Differences between doctors

The average figures for prescribing in counties or administrative districts conceal the great variations that exist in the prescribing habits of individual doctors. These differences are demonstrated in a survey of the prescribing habits of five selected groups of doctors in 1972, 1973 and 1974. Their prescribing has been compared with the average prescribing for the whole province during those years (Table 3).

Group I was a control group of doctors in 19 practices chosen because their total use of hypnotics in 1972 was the same as the average of the whole province. Seven of the practices were in Belfast, three in Co. Down, two in Co. Armagh, three in Co. Antrim and two in Co. Londonderry. The pattern of prescribing of this group was similar to the average of the whole province except that they were rather higher prescribers of Mandrax. Over the 3 years the proportion of their prescriptions written for barbiturates and Mandrax fell from 44 per cent and 19 per cent respectively to 39 per cent and 7 per cent. The proportion of prescriptions for Mogadon rose from 35 per cent to 48 per cent so becoming similar to the provincial average.

TABLE 3

Prescribing of Groups of Doctors

Group No.	Description (see text)	Year	Average prescribing of hypnotics Daily doses/ 1000/day	PERCENT OF HYPNOTIC PRESCRIBING		
				Barbiturates	Mandrax	Mogadon
I	CONTROL	1972	40.7	44	19	35
		1973	40.8	41	12	41
		1974	40.3	39	7	48
II	HIGH	1972	85.2	56	10	28
	HYPNOTIC	1973	85.0	54	6	38
	PRESCRIBERS	1974	83.5	49	4	46
III	OVER 75%	1972	43.5	83	5	11
	BARBITURATES	1973	43.0	76	3	18
		1974	43.4	68	1	29
IV	OVER 65%	1972	22.9	17	5	75
	MOGADON	1973	23.5	21	3	74
		1974	25.7	17	3	78
V	OVER 35%	1972	35.5	31	45	18
	MANDRAX	1973	36.7	27	36	29
		1974	36.8	31	23	41
PROVINCE AVERAGE		1972	40.7	51	12	34
		1973	41.0	48	8	42
		1974	40.4	43	5	49

Group II was a group of 13 doctors who were high prescribers of hypnotic drugs and who all prescribed more than 85 daily doses/1,000/day of these drugs in 1972. The high prescribing of hypnotics by these doctors persisted throughout the three years of the survey. They prescribed a slightly higher proportion of barbiturates and a smaller proportion of Mandrax and Mogadon than was prescribed by the average doctor. Over the 3-year period, the proportion of barbiturates fell from 56 per cent to 49 per cent in line with the trend apparent in the whole province and prescribing of Mogadon rose to 46 per cent of all hypnotics.

Group III was a group of doctors from 21 practices, scattered across the province, chosen because in 1972 more than 75 per cent of their prescriptions for hypnotics were for barbiturates. The overall use of hypnotics by these doctors was not unduly high, 43 daily doses/1,000/day, and they were infrequent prescribers of Mandrax. Over the 3-year period there was a sharp fall in the proportion of their prescriptions written for barbiturates from 83 per cent to 68 per cent and this was accompanied by an increase in the proportion of prescriptions for Mogadon from 11 to 29 per cent.

Group IV was a group of doctors in 19 practices chosen because in 1972 more than 65 per cent of their prescriptions for hypnotics were for Mogadon. These doctors were low users of hypnotics 23 daily doses/1,000/day and they showed less change in their prescribing than any other Group over the 3-year period.

Group V There were in 1972 none of the very heavy users of Mandrax that there had been in 1969 but a group of doctors from 14 practices was chosen because in 1972 more than 35 per cent of their prescriptions were for Mandrax. These doctors were below the average of the province in their prescribing of hypnotics, 35.5 daily doses/1,000/day. They differed from other groups because they replaced their prescribing of Mandrax over the 3-year period by Mogadon but did not reduce their barbiturate prescribing.

This small survey not only illustrates the great differences which may exist between doctors but it shows how remarkably constant the overall prescribing of sleeping tablets by doctors is. The survey suggests that a decrease in the use of barbiturates and Mandrax has occurred, the fall being greatest amongst those who were initially the highest users. There has been a rise in the prescribing of Mogadon, the biggest rise being amongst those who were initially the lowest prescribers of the drug.

Prescribing and the Date of Graduation of Doctors

The age of prescribing doctors was not available but the date of graduation was known. Four graduation periods were selected (Table 4). The two groups who graduated before 1947 were taught in medical school at a time when only chloral-hydrate or the barbiturates were available. Those graduating before 1957 would have learnt as students about non-barbiturate hypnotics such as thalidomide and

Table 4

Prescribing and Date of Graduation

Graduation Date	1972		1973		1974	
	(1)	(2)	(1)	(2)	(1)	(2)
Pre 1935	34.3	48	36.1	47	34.9	40
1944 – 47	36.7	49	38.7	46	39.4	41
1953 – 57	35.2	50	35.3	47	38.2	45
1961 – 68	41.7	48	39.7	45	39.3	42
Provincial Average		51		48		43

Column (1) gives the prescribing of hypnotics as daily doses/1000/day
Column (2) gives percentage barbiturates prescribed

glutethimide, and only those graduating in the last period 1961–68 would have heard about Mogadon and Mandrax during undergraduate or early postgraduate days. There was no significant difference between the four groups either in respect of their total prescribing of sleeping drugs or their prescribing of barbiturates. During the three-year period all showed the expected fall in their use of barbiturates. Doctors graduating before 1935 showed the lowest overall prescribing of hypnotics and the lowest proportionate use of barbiturates.

Prescribing and practice size

There were 26 practices with less than 1,000 patients per doctor and 35 practices with over 3,000 patients per doctor. These two groups of practices were compared with 97 practices with between 1,900 and 2,300 patients per doctor. The mean size of practice in Northern Ireland is 2,125 patients per doctor.

It was found that the large practices and those with 1,900–2,300 patients/doctor prescribed 39.5 and 37.7 daily doses/1,000/day of hypnotic drugs respectively which was not significantly different from the province as a whole. In the 26 small practices the prescribing was twice as high, 78.3 daily doses/1,000/day ($P<0.05$ using the paired T test).

International comparisons

The prescribing of hypnotics in Northern Ireland has been compared with the prescribing of these drugs in Norway where the data is derived from information about the supply of drugs on prescription by pharmacists of the state drug monopoly, Norsk Medicinaldepot, to the community. For this comparison, phenobarbitone is added to the Northern Ireland figures because it is used in Norway

Fig. 3

Comparisons between Northern Ireland and Norway

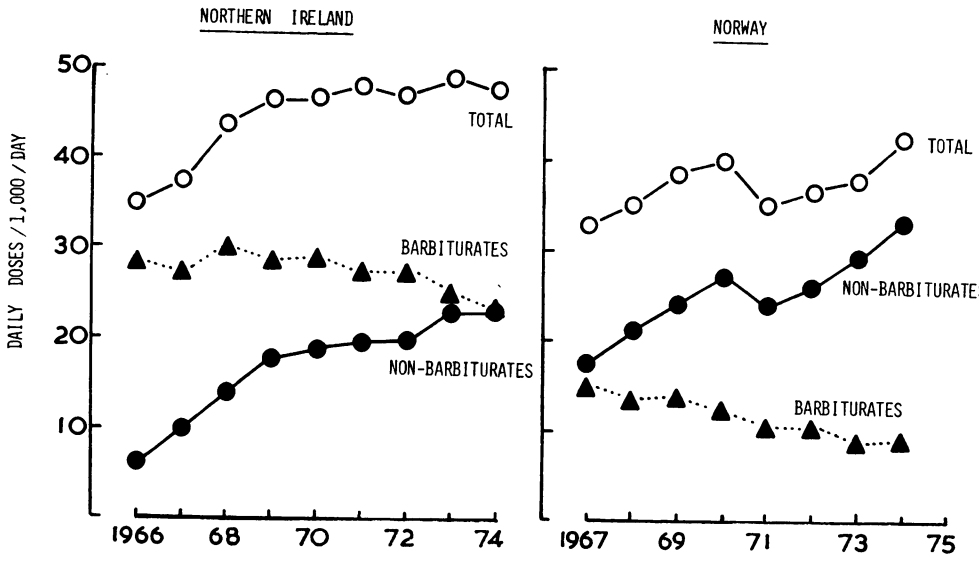


Fig. 3. *In the Norwegian data, phenobarbitone is included as it has a significant use as a hypnotic. For the sake of an exact comparison phenobarbitone has been included in the construction of the Northern Ireland graph for Fig.* 3, *but because it is not used significantly as a hypnotic in Northern Ireland, it is excluded from Fig.* 1 *and Fig.* 2 *and from the tables. Other slight discrepancies between the graphs and the tables are due to the exclusion of rarely prescribed hypnotic mixtures from the comparisons between doctors and geographical areas.*

as a hypnotic and is included in the Norwegian hypnotic prescribing. In both countries, there has been a rise in the prescribing of hypnotics since 1966 to 48 daily doses/1,000/day in Northern Ireland and 42 daily doses/1,000/day in Norway. Figure 3 shows that in Norway, the use of barbiturates was already declining in 1967. In 1974, non-barbiturates represented 78 per cent of all the hypnotics prescribed in Norway. In Norway there has been no serious misuse of Mandrax as was encountered in Belfast in the late 1960's and about 14 per cent of the prescribing is still Mandrax and only 31 per cent of it is Mogadon.

Detailed information about the doses of hypnotics prescribed by individual doctors or practices in relation to the number of people in the community is not yet available from England. However, the number of prescriptions written per 1,000 of the population can be estimated and in Fig. 4 is compared with similar data from Northern Ireland. The prescribing of all hypnotics and of the barbiturates was higher in England than in Northern Ireland in 1966. It has fallen steadily since that time and in 1973, the number of prescriptions per 1,000 persons/day, was similar in the two countries for all hypnotics, for barbiturate hypnotics and for non-barbiturate hypnotics.

FIG. 4

Comparisons between Northern Ireland and England by Number of Prescriptions

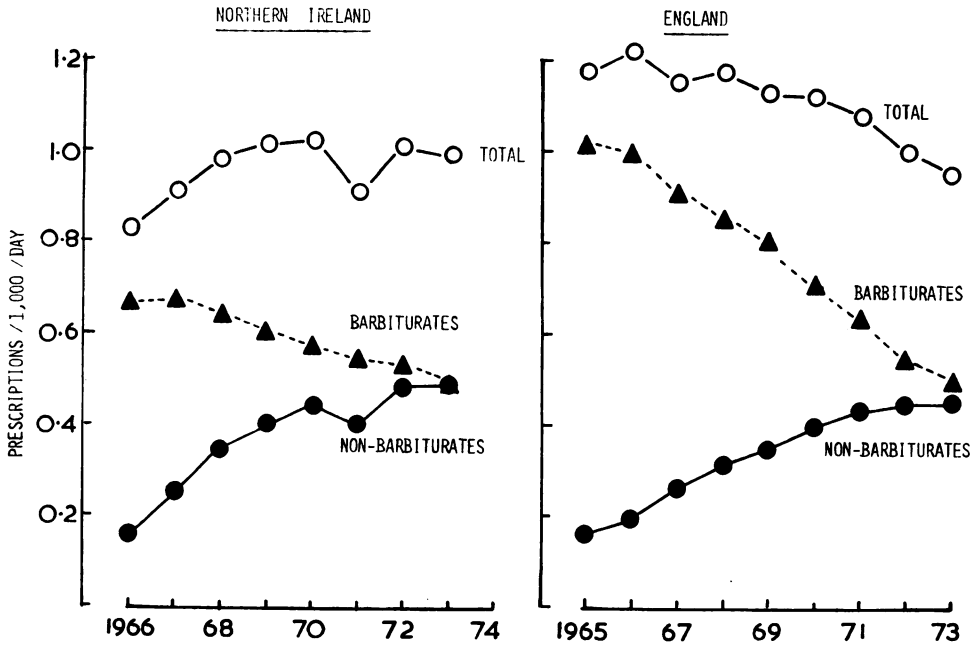


FIG. 4. *Although in 1966 prescribing of sleeping tablets in London seemed to be higher than in Northern Ireland, the gradual fall which has occurred since has made the English prescribing both in total and in distribution between barbiturates and non-barbiturates approximately the same.*

Discussion and Conclusions

The prescribing of hypnotics in Northern Ireland has risen during the last eight years but may now be levelling off between 40 and 45 daily doses/1,000/day. In 1974, the average rate of prescribing of hypnotics in the province was about 44 daily doses/1,000/day. This rate varied greatly from area to area. It was three times higher in South Belfast, 76.6 daily doses/1,000/day than in Fermanagh, 23.5 daily doses/1,000/day. The rate of prescribing of hypnotics in Northern Ireland does not appear to have been affected by the recent civil strife and it was not, in 1974, dissimilar from that of Norway or England.

Although there are great variations from practitioner to practitioner in their prescribing of hypnotics, an individual practitioner seems to persist in his prescribing habits, the high prescriber remaining a high prescriber and the low remaining a low prescriber even though their choice of hypnotic drugs changes.

Indeed, there has been a decrease in the use of barbiturates and a marked increase in the prescribing of nitrazepam (Mogadon) a benzodiazepine and this change is apparent in the prescribing of all doctors whether high or low prescribers of hypnotics. Mandrax and other non-barbiturate hypnotics apart from Mogadon have become less popular in the last few years.

It is not difficult to understand why there is such great variation in the prescribing of sleeping tablets. The complaint of sleeplessness is subjective and a doctor in deciding whether to prescribe for it or not relies partly on knowledge of the patient's character and partly on the vehemence of his complaints: there are no objective criteria on which he can rely. Indeed, the few studies which have been carried out, usually in hospitals or under laboratory conditions show that there is a very poor correlation between the complaints a patient makes of sleeplessness and the number of hours of sleep which are actually recorded. It is known too that the placebo effects of an impressive looking tablet or capsule may be considerable in the treatment of these complaints.

The findings of this survey suggest that the prescribing of sleeping tablets is not determined predominantly by the medical needs of patients. It is more likely that sleeping tablets are prescribed by doctors mainly in response to demands from patients and that these vary from area to area according to the social climate, the sophistication of the community, its concepts of what constitutes illness and its attitudes to drugs and drug taking. The doctor may be influenced by his training in medical school, his postgraduate experience and drug advertising but he too is probably greatly influenced by the attitudes to the use of drugs prevalent in his community. There is some evidence that doctors with small numbers of patients are more likely than others to accede to the demands of their patients.

If a rational policy for prescribing hypnotics is to be developed it is necessary to find out more than is at present known about patients who demand sleeping tablets, why they need them and what benefits or harm they derive from taking them. Yet even now the evidence already suggests that the long term effects of any hypnotic on sleep and cerebral activity are such that they should not be pre-

scribed to any patient unless there is a very good reason and in any case for only a short period of time.

Summary

The prescribing of sleeping tablets and medicines by Northern Ireland general practitioners has been analysed for the years 1966–1974. Total prescribing has risen from 30 daily doses per 1,000 of population per day to 44 daily doses, most of the increase occurring between 1966 and 1969. A combination of methaqualone and diphenhydramine was popular for several years until teenage abuse led doctors to reduce their prescribing. Prescribing of hypnotics is highest in a suburban area of Belfast and lowest in remote country areas, it bears no relationship to civil strife or to the age of the prescribing doctor. Doctors with small practices prescribe twice as much per 1,000 of their patients as doctors with average or large practices. All doctors have tended to replace barbiturates (which amounted to 80 per cent of hypnotic prescribing in 1966) by nitrazepam which now equals in volume the prescribing of all the barbiturate hypnotics added together. Comparisons are made with prescribing patterns in England and in Norway.

References

British Medical Journal (1975). Leading Article. Barbiturate on the way out. *British Medical Journal*, **3**, 725.

Elmes, P. C., Hood, H. and Wade, O. L. (1976). Prescribing in Northern Ireland: Methods of Analysis. *Ulster Medical Journal*, **45**, 56.

Oswald, I. (1973). Sleep. Physiology and Pharmacology. *Prescribers' Journal*, **13**, No. 5, 100-104.

Wells, F. O. (1975). Are our barbiturates really necessary? *British Medical Journal*, **3**, 285.

SYMPTOMS OF NON-TOXIC NODULAR GOITRE

by

S. H. ARMISTEAD, M.B., B.S., L.R.C.P., M.R.C.S.

Department of Surgery
The London Hospital

Now at Royal Victoria Hospital, Belfast

IN 1932, Cecil Joll, in his book "Diseases of the Thyroid Gland" emphasised that "although respiratory symptoms due to tracheal compression and alteration of voice were common", dysphagia was a "decidedly rare feature of simple goitre". Since then there has been little documentation on the subject. The following is an account of the symptoms found in a series of patients undergoing surgery for nodular goitre.

Method of Study

For the purposes of this study a goitre was defined as a visible and palpable enlargement of the thyroid gland. In normal adults the average weight of each lobe is about 12 g. A combined weight of 35 g or more is both visible and palpable and hence constitutes a goitre. Multinodularity was demonstrated clinically by palpation and confirmed at operation and by pathological examination.

Patients

One hundred and thirty-six consecutive patients operated on for goitre by a single surgeon at The London Hospital during the years 1965 to 1974 were studied. Some patients came to operation for removal of a large, bilateral goitre while others were referred for treatment of a single nodule.

Table

Presentation of Nodular Goitre

Complaint		*No. of patients*	%
Swelling alone		86	63
Swelling and symptom(s)		46	34
Respiratory symptoms	28 (21%)		
Dysphagia	23 (17%)		
Change of voice	17 (12.5%)		
None		4	3
		136	100

Patients presenting with a swelling alone were either anxious about malignancy or its cosmetic effect. Those who complained of dysphagia either said they had a peculiar feeling in their throat on swallowing, or that food actually stuck in their throat. Only patients who complained of "local" respiratory symptoms, such as difficulty with breathing localised to the neck region were included. Those with heart failure, bronchitis or other respiratory problems were excluded. A complaint of change of voice was either due to hoarseness or to increase in pitch. The clinical features are shown in the Table.

Results

Although no statistical correlation was found between the age of the patient, the weight of the gland and any sympton, a greater number of large glands was found in older patients. The weight range of the resected gland was 20 – 420 g (mean = 103 g) and the age range was 17 to 79 years (mean = 48 years). Two patients had all three symptoms, one was a 79 year old and the gland weighed 320 g. While the other was aged 53 and the gland weighed only 30 g.

Twenty-five per cent of the patients had some retrosternal extension of the goitre; sixty per cent of these (14 per cent of total) had one or more of the symptoms described.

In the series there were 11 male patients (eight per cent). Dysphagia and change of voice were more common in male patients but respiratory symptoms were less common. The increased incidence of the latter in females may be due to the peculiar "choking" feeling complained of by many female patients.

Discussion

The incidence of symptoms of multinodular goitre in a retrospective study of this nature is difficult to assess accurately. Clincal records are liable to be incomplete because the relevant symptoms may not all have been documented originally. However, these are not likely to be fewer than those recorded here. In this group of patients it appears that the incidence of dysphagia is higher than that described originally by Joll. While these figures serve as a guide to incidence of symptoms they must be used with some reservation, as they represent a selected group of patients.

The dysphagia experienced is probably not a true mechanical obstruction but only an impression of food sticking at the level of the swelling. Direct laryngoscopy revealed no vocal cord paralysis in those complaining of change of voice. Respiratory difficulty was extremely subjective, complaints varying from "shortness of breath" to "a choking feeling" in the neck.

All symptoms seemed to increase in intensity once the swelling was confirmed by a doctor.

Summary

Multinodular goitre is a common disease generally presenting with a lump in the neck alone (63 per cent) or with "local" difficulty with breathing (21 per cent) or dysphagia (17 per cent) and/or change of voice 12.5 per cent). These symptoms appear to bear no relation to the weight of the gland or the age of the patient, although the weight of the gland does increase with age.

No true mechanical cause for the symptoms could be identified, most being attributed to psychological awareness of the swelling.

References

JOLL, C. A. (1932). *Diseases of the Thyroid Gland.* London: William Heinemann (Medical Books) Limited.

MONTGOMERY, D. A. D. and WELBOURN, R. B. (1975). *Medical and Surgical Endocrinology*, p. 278. London: Arnold.

SCHLESINGER, M. J., GARGILL, S. L. and SAXE, I. M. (1938). Studies in Nodular Goitre. *Journal of the American Medical Association*, **110**, 1638.

Acknowledgements

I am grateful to Mr. J. E. Richardson, Professor I. Doniach, Professor H. D. Ritchie, Professor D. A. D. Montgomery and Mr. T. Kennedy for their encouragement.

SCLEROSING PERITONITIS DUE TO PRACTOLOL SIMULATING AN OVARIAN TUMOUR

by

J. M. DUNLOP, M.R.C.O.G., D.P.M., and H. LOGAN, M.Ch., F.R.C.S.

Ulster Hospital, Dundonald, Belfast

A 68 YEAR OLD married woman was admitted to the Ulster Hospital, Belfast in October 1975 with a one month history of generalized crampy abdominal pain, abdominal swelling and increasing constipation. She had a myocardial infarction in 1969 and a hemiplegia in 1972 and had recovered well from each. She had been on treatment with practolol for three years for hypertension. In 1974 she attended an eye department because her eyes had "dried up" and kerato-conjunctivitis sicca was diagnosed. There was epithelial damage to both cornea with a deep central ulcer in the left cornea and visual acuity was reduced to less than 50 per cent in each eye. Practolol was thought to be responsible and was stopped. Her eyes improved with local treatment but tear secretion in the left eye remained very reduced.

On examination she was a frail elderly patient wearing unusual spectacles with plastic sidepieces. There was a mass arising out of the pelvis and reaching to the umbilicus which was provisionally diagnosed as an ovarian tumour.

Her poor general condition due to generalized vascular disease made surgery hazardous, and as she improved in hospital she was allowed home after two weeks. One month later she was readmitted with a one week history of vomiting and crampy abdominal pain. The abdominal swelling was unchanged. Despite her poor general condition laparotomy was performed under an epidural anaesthesia. The abdominal tumour was found to be dilated loops of small bowel matted together by peritoneal adhesions. There was no ovarian tumour and the pelvic organs were normal. The extensive adhesions were laboriously divided to release the loops of small bowel following which the patient made a slow but steady recovery and was discharged three weeks after operation. Four months post-operatively she remains well.

Discussion

There are several reports of sclerosing peritonitis arising after the use of practolol (Brown et al, 1974, Windsor, Kurrein and Dyer, 1975, Trudinger and Fitchett 1976). This patient is of particular interest as she presented in a gynaecological department and we feel that the condition must now be considered as a differential diagnosis of an abdominal swelling in all patients who have received practolol. It also illustrates the importance of carrying out a laparotomy in order to establish a diagnosis in all suspect cases of ovarian tumour, no matter how hopeless the situation seems.

This example of the "Practolol induced syndrome" demonstrates two of its main manifestations.

1. Effects on the eyes—If ocular changes occur there is a progressive dryness which may eventually lead to inflammation. Filamentary or punctuate keratitis may then develop and may progress to corneal ulceration and impairment or loss of vision. Secondary conjunctivitis may lead to scarring, especially in the fornices (which become less deep) and may eventually progress to symblepharon or even entropion. These more severe eye changes have only been reported when the syndrome was initially unrecognised and ingestion of practolol continued.

2. Effects on the peritoneum—Recently cases have been reported of a sclerosing peritonitis which presents with the signs and symptoms of abdominal pain, sub-acute small bowel obstruction or an apparent abdominal mass but with no tumour found at laparotomy. Some of the case reports have referred to dry eyes and skin lesions apparently preceding the abdominal symptoms, but in the absence of such detail in other reports, one cannot assume that this is always the sequence of events.

This patient had been on practolol for three years which had been discontinued when its association with her eye symptoms was recognised. Eighteen months after this she presented with the peritoneal side effects of this therapy. As she had had no previous abdominal surgery and as there was no evidence of tuberculous peritonitis or of a neoplasm it is unlikely that the findings could be explained on any other basis. This patient's only other long term medication was Lanoxin (Wellcome) and such a complication with this drug has not been described. At present it is recommended that practolol should only be used to control cardiac arrhythmias in the immediate post-infarction period. Further investigation of its side effects is being actively undertaken by the manufacturers, but how practolol acts to cause the peritonitis is at present unknown.

Summary

The administration of practolol for three years produced a sclerosing peritonitis which simulated an ovarian tumour presenting eighteen months after therapy had been stopped.

References

Brown, P., Baddeley, H., Read, A. E., Davis, J. D., McGarry, J. (1974). Sclerosing peritonitis: An unusual reaction to a B-adrenergic-blocking drug (practolol). *Lancet*, **2**, 1477.

Trudinger, B., Fitchett, D. (1976). Practolol perintonitis presenting as a pelvic mass. *British Journal of Obstetrics and Gynaecology*, **83**, 326.

Windsor, W. O., Kurrein, F., Dyer, N. H. (1975). Fibrinous peritonitis: A complication of practolol therapy. *British Medical Journal* (1975), **2**, 68.

THE PRESENT STATUS OF VAGOTOMY

(Based on a paper read to the European Society for Surgical Research in Dublin, April, 1976)

by

TERENCE KENNEDY, M.S., F.R.C.S.

Royal Victoria Hospital, Belfast

IT is now generally accepted that some form of vagotomy is the best operation for chronic duodenal ulcer and there is a minority view that it is also appropriate for gastric ulcer. The surgeon has several alternative forms of vagotomy and types of drainage available and it is the purpose of this paper to review the current status of these different procedures.

With any operation there are three requirements. First, the mortality must be minimal. In our series during the past ten years there have been 1,033 vagotomies of various types with two deaths, a rate of 0.19 per cent. There are many other published series with a comparably low mortality. Secondly, there must be an acceptably low incidence of recurrent ulcer and, thirdly, undesirable side effects should, as far as possible, be eliminated. It is these second and third points which demand our attention.

Truncal vagotomy (T.V.) in which both anterior and posterior vagi are completely divided at the level of the hiatus, has been associated with gastrojejunostomy (G.J.) and more commonly with pyloroplasty (P). Many years ago a curious form of episodic diarrhoea became apparent as an important side effect. The

TABLE 1

Truncal versus Selective Vagotomy Controlled Trials

	Diarrhoea		*Recurrent symptoms*	
	T.V. %	S.V. %	T.V. %	S.V. %
KRAFT et al Michigan	37	27	12	5
SAWYERS et al Tennessee	21	12	1	0
KENNEDY et al Belfast	28	8	9	2
KRONBERG et al Copenhagen	46	12	8	5
	29.5	15.3	5.9	2.8

cause is unknown, though uncontrolled emptying of the stomach plays a part (McKelvey, 1970) and deficiency of Ig A may be significant (McLaughlin et al, 1976). It was thought that denervation of the small bowel and biliary tract might be important and thus the limitation of vagotomy to the gastric branches, selective vagotomy (S.V.) was widely practised. In four controlled trials (Table 1) the incidence of diarrhoea was diminished when compared with the incidence after T.V. and drainage. Somewhat surprisingly, each trial showed a lower incidence of recurrent ulcer after S.V.

Another troublesome symptom has been dumping, less common and less severe than after gastrectomy, but present in about one-third of all cases in a number of carefully conducted, prospective studies. A third problem has been bile reflux and bile vomiting. In three controlled trials (Table 2) there has been a higher incidence after gastro-jejunostomy but this only reached statistical significance in the Glasgow trial. The type of vagotomy was not important.

TABLE 2
Bile Vomiting

	Gastrojejunostomy (n=330) %	*Pyloroplasty* (n=367) %	
KAY et al (T.V.) Glasgow	16.0	6.0	($p<0.01$)
GOLIGHER et al (T.V.) Leeds	14.5	10.1	
KENNEDY et al (S.V.) Belfast	10.4	8.7	

When we look at the influence of the drainage on the rate of recurrence (Table 3) in nearly two thousand patients from six centres, we see that the recurrence after G.J. is about a third of that after pyloroplasty. This phenomenon has no logical explanation, though it must be remembered that G.J. alone cures about half of all duodenal ulcers. Antrectomy, coupled with either S.V. or T.V., gives a remarkably low rate of ulcer recurrence. It is, however, more likely to cause side effects and, if routinely used, might reintroduce a mortality problem.

At this point we may conclude that neither truncal nor selective vagotomy, combined with pyloroplasty or gastrojejunostomy, meets all three of the defined requirements of an ideal ulcer operation. In the early days of T.V. no drainage was used but too many patients developed trouble from stasis. In 1969 Burge proposed that, when there was no outlet stenosis, S.V. could be used without drainage. Unfortunately this thesis did not prove to be correct.

In order to reinforce the effectiveness of vagotomy combined with pyloroplasty, Holle (1964) advocated preservation of the innervation of the pylorus and antrum by carefully dissecting out the nerves described by Latarjet fifty years ago. It was

TABLE 3

Drainage and Recurrence Rates

Author	*Pyloroplasty* (656)		*Gastrojejunostomy* (776)		*Antrectomy* (471)	
	Proven %	*Suspect* %	*Proven* %	*Suspect* %	*Proven* %	*Suspect* %
GOLIGHER et al Leeds	6.7	4.3	2.5	3.4	0	1.7
JORDAN et al Houston	9.6	1.1	—	—	1.1	1.1
KAY et al Glasgow	4.8	—	3.0	—	—	—
KENNEDY et al Belfast	6.7	2.1	1.7	2.6	—	—
KOCK et al Gothenburg	9.9	—	0	—	0	—
SEIDEL et al Marburg	8.0	—	—	—	0	—

left to Amdrup (1970) and Johnston (1970) independently to do the same limited vagotomy, but also to omit any drainage procedure. They respectively called this operation "parietal cell vagotomy" and "highly selective vagotomy". It has many other names, among them:—acid fundic, gastric proximal, proximal gastric vagotomy (P.G.V.). In the U.K. P.G.V. is the approved name, though highly selective vagotomy (H.S.V.) is often used. This operation has obvious attractions. It is gastrointestinally non-invasive (the gut is not opened) thus lessening the risk of infection, and side effects attributable to the drainage procedure should be eliminated. Early uncontrolled data led to many enthusiastic reports, claiming that dumping and diarrhoea were both virtually eliminated.

In an attempt to evaluate this new operation we have conducted a random controlled trial of P.G.V. without drainage against S.V. and G.J. There were 50 cases in each group and 99 were followed for a maximum of four years and a minimum of one year. There was only one proven recurrence in each group. Dumping and diarrhoea were almost eliminated and the incidence of minor symptoms did not differ from that of patients with no known gastrointestinal disorder. The future looked rosy but at the same time the results of a very similar trial were published from Denmark (Kronborg and Madsen, 1975). Here 50 patients with P.G.V. were compared with 50 having S.V. and P. The follow up time was the same and again there was a highly significant diminution in dumping and diarrhoea. But there was one big difference from our trial—a recurrent ulcer rate of 22 per cent after P.G.V. and eight per cent after S.V. and P.

TABLE 4

Prospectively Studied Vagotomies
(Kennedy and Johnston)

Operation	*Number*	*Mean follow up in years*	*Recurrences*	*Percentage*
T.V. + P.	50	5+	3	6
S.V. + P.	99	5+	7	7
S.V. + G.J.	117	4	2	1.7
P.G.V.	132	2	7	5.3
	398		19	4.8

Since publishing the interim results of our trial we have seen further recurrences. Our overall recurrence rate for P.G.V. is now 5.3 per cent (Table 4). Superficially this seems to compare well with the rate after V. and P. but it should be noted that the follow up time of the latter cases is much longer, ranging from five to ten years.

In an attempt to discover the true recurrence rate I have collected information from 19 European surgeons (Table 5), showing a rate of 3.2 per cent. The follow up time was quite short in many instances and the ultimate recurrence rate will almost certainly be considerably higher. The survey confirmed the low mortality of P.G.V. and was reassuring in showing only an 0.2 per cent need to reoperate for failures of gastric drainage.

TABLE 5

Collected European P.G.V. Data

	Number	*Percentage*
Operations	4724	
Deaths	14	0.3
Lesser curve necrosis	11	0.2
Reoperation for drainage	14	0.3
Recurrent ulcer	152	3.2

The incidence of the mysterious and dreaded complication of lesser curve necrosis was also very low. The reason why the lesser curve occasionally breaks down is not known, though chronic renal failure may be associated. As a prophylactic measure it is recommended that the serosal coat should be reconstructed over the bared lesser curve musculature, a very simple modification.

The reported rates of recurrence after P.G.V. have varied widely and one wonders if all surgeons are performing precisely the same operation. Amdrup (1970) has defined the parieto-antral junction with a pH probe; Johnston (1970) has preserved the whole of the terminal "crow's foot" of the anterior nerve of Latarjet and we have measured 6 cm. back from the pyloric ring. Thus the amount of stomach left innervated may have varied. It may be that thorough clearing of the distal 5 cm. of oesophagus is the really important factor.

Recurrences are usually attributable to incomplete denervation of the parietal cell mass due to overlooking one or more vagal fibres. To avoid this Burge (1969) designed an intra-operative electrical test of vagal integrity but this has found little favour. Grassi (1975) has used a pH probe to define areas of high acidity and found that there is always an intact vagal fibre leading to such an area. There is also the suggestion that cut fibres may sprout and lead to re-innervation.

Much attention has been directed to the hormone gastrin; if the antrum is left innervated, could the release of gastrin be enhanced? It has been shown that gastrin levels rise after all forms of vagotomy, probably due to loss of the inhibitory effect of acid. Our data (Hayes, 1975) indicate that the rise in basal levels is no greater after P.G.V. than after S.V. and drainage. Stadil and his colleagues (1974) also showed that the response to a protein meal stimulus is no greater after P.G.V.

Recently there has been much interest in the concept of G cell hyperplasia. Some recurrences are due to this phenomenon and would have been better treated by antrectomy in the first instance. It has been shown that those with high basal acids have a higher risk of recurrence, but measurement of gastrin should be a more precise indicator. Alternatively the G cell population can be estimated by immunoperoxidase staining or immunofluorescent techniques.

P.G.V. has been designed to avoid rapid gastric emptying but occasionally emptying may be unduly slow, perhaps because of too much denervation, and the patient then complains of fullness, vomiting or even gastric ulceration; a secondary drainage operation will be required. Patients with pyloric stenosis are usually given a drainage procedure but Johnston and Imperati (1974) have described dilatation of the stenosis with a finger or even with Hegar's dilators. Division of the stricture longitudinally, closing it like a Heineke-Mickulicz pyloroplasty, can be done without damaging the pylorus. This procedure has been called duodenoplasty by Tanner and shown to give good results (Kennedy, 1976).

In the emergency situation vagotomy with drainage can be used for perforated duodenal ulcer, and it is perfectly possible to close a perforation and complete the operation with a P.G.V. Bleeding duodenal ulcers demanding emergency surgery virtually always involve the gastro-duodenal artery. Duodenotomy, suture of the bleeding point and completion with P.G.V. without pyloroplasty is a sound procedure.

S.V. and T.V. with drainage have been widely used in the treatment of gastric ulcer; recently P.G.V. without drainage has also been used. These conservative operations are attractive but a careful trial conducted by Duthie has failed to

show any advantage over orthodox Billroth I gastrectomy. Most surgeons will be deterred by the fear of missing a gastric cancer.

When gastric ulcer is combined with a duodenal ulcer, some form of vagotomy is quite acceptable, though excision biopsy of the gastric ulcer is mandatory.

Conclusion

The increasingly conservative approach to ulcer surgery in recent years has gone a long way to allaying the physician's fears of seeing his patient transformed into a gastric cripple, let alone the foundation of a tombstone. The surgeon is much closer to his El Dorado. Undesirable side effects and risk have been virtually eliminated by P.G.V. The one remaining query is the recurrence rate. This may well turn out to be around ten per cent. If so, no harm will have been done these patients who will simply need antrectomy and conversion to truncal vagotomy. Perhaps the H_2 receptor blockers, currently undergoing clinical trials, will prove suitable for this group.

References

Amdrup, E. and Jensen, H. E. (1970). *Gastroenterology*, **59**, 522.

Berger, T., Kock, N. G. and Norberg, P. B. (1972). *Acta Chirurgica Scandinavica*, **138**, 499.

Burge, H. and Frohn, M. J. (1969). *British Journal of Surgery*, **56**, 452.

Burge, H., MacLean, C., Stedeford, R. and others (1969). *British Medical Journal*, **3**, 690.

Goligher, J. C., Pulvertaft, C. N., Irvin, T. T. and others (1972). *British Medical Journal*, **1**, 7.

Grassi, G. (1975). *Surgery Gynaecology and Obstetrics*, **140**, 259.

Hayes, J. R., Ardill, J., Kennedy, T. and Buchanan, K. D. (1975). *Irish Journal of Medical Science*, **144**, 349.

Holle, F. (1964). *Chirurge Vereingung Munchen.*

Imperati, L., Marinaccio, F. and Altieri, A. (1974). *Nouvelle Presse Medicale*, **3**, 1811.

Johnston, D. and Wilkinson, A. R. (1970). *British Journal of Surgery*, **57**, 289.

Jordan, P. H. and Condon, R. E. (1970). *Annals of Surgery*, **172**, 547.

Kennedy, F., MacKay, E., Bedi, B. S. and Kay, A. W. (1973). *British Medical Journal*, **2**, 71.

Kennedy, T. (1976). *Annals of Royal College of Surgeons of England*, **58**, 144.

Kennedy, T., Connell, A. M., Love, A. H. G. and others (1973). *British Journal of Surgery*, **60**, 944.

Kennedy, T., Johnston, G. W., Love, A. H. G. and others (1973). *British Journal of Surgery*, **60**, 949.

Kennedy, T., Johnston, G. W., MacRae, K. D. and Spencer, E. F. Anne (1975). *British Medical Journal*, **2**, 301.

Kraft, R. O., Fry, W. J., Wilhelm, K. G. and Ransom, H. K. (1967). *Archives of Surgery (Chicago)*, **95**, 625.

Kronborg, O., Mahnstrom, J. and Christiansen, P. M. (1970). *Scandinavian Journal of Gastroenterology*, **5**, 519.

Kronborg, O. and Madsen, P. (1975). *Gut*, **16**, 268.

McKelvey, S. T. D. (1970). *British Journal of Surgery*, **57**, 741.

McLoughlin, G. A., Chapman, D. M., Hede, J. E. and others (1976). *Lancet*, **1**, 168.

Sawyers, J. L., Scott, H. W., Edwards, W. H. and others (1968). *American Journal of Surgery*, **115**, 185.

Seidel, W., Troid, C. H., Lorenz, Q. and others (1973). *Klinische Wochenschrift*, **51**, 477.

Stadil, F., Rehfeld, J. F., Christiansen, P. M. and Kronborg, O. (1974). *British Journal of Surgery*, **61**, 884.

ACUTE SEPTIC ARTHRITIS IN CHILDREN

by

R. A. B. MOLLAN, F.R.C.S.

Withers Orthopaedic Centre, Musgrave Park Hospital

Introduction

THREE decades ago in the pre-antibiotic era, infection of a major joint carried an appreciable mortality and the end result of the joint was usually disastrous. Treatment consisted of rest and drainage, either by aspiration or formal surgical exploration. Since the introduction of antibiotics the results have improved dramatically. At first antibiotics were given systemically then later supplemented by intra-articular injection. However problems in treatment still remain. Local methods of irrigation, warning of the danger of intra-articular antibiotics and indications for surgical drainage are points still under discussion. There remains the need for constant surveillance of aetiological agents and their sensitivity in order to give optimal antibiotic cover. These points prompted a survey of acute septic arthritis as an aid to further consideration of the disease and its treatment in the acute phase.

Material and Methods

The records of two Belfast Hospitals* were searched for all cases of primary joint infection presenting between 1960 and 1974. Only cases of proven acute haematogenous septic arthritis were included in the survey. Cases diagnosed on clinical grounds alone, without the finding of pus or specific radiological bone changes were discarded. Those cases in which there was doubt as to whether the primary lesion was adjacent acute osteomyelitis or where there was insufficient information recorded were excluded. Seventy-six cases were considered, only twenty-nine fulfilled the criteria and were analysed in detail. The average follow-up after discharge from hospital was two years.

Results

The age distribution is shown in Table I. There were five patients under two months old at the time of presentation. There was a 2: 1 male preponderance, there being nineteen males and ten females. Only five patients had a history of

Table I

Age distribution of acute septic arthritis

Age (years)	0–1	2	3	4	5	6	7	8	9	10	11	12	13
Number of Patients	5	7	4	2	7	0	0	2	3	0	1	2	1

* The Royal Belfast Hospital for Sick Children and The Ulster Hospital, Dundonald.

trauma which could be considered relevant. The sites of infection are given in Table II. One patient had simultaneous infection in a shoulder and hip joint,

TABLE II

Site distribution of acute septic arthritis

Site	Shoulder	Elbow	Hip	Knee	Ankle
Number of Cases	1	3	10	13	1

another bilateral hip infection. There was a preference for lesions on the left side, twenty patients had a joint involved on the left side, nine patients had a joint involved on the right side. The time between onset of symptoms and diagnosis was in nearly all cases less than five days, and half of the patients presented within forty eight hours of onset. Only one patient had a normal temperature on admission, pyrexia ranged from 37.3°C to 40.0°C. In all but two patients the temperature had returned steadily to normal limits within four days. One of these two patients who failed to settle had continuing bone and joint infection, the other wound abscess which was subsequently drained with no evidence of deep infection.

Twenty patients were toxaemic on admission. The average haemaglobin on admission was 11.5g./dl blood. The white blood cell count was elevated in eleven of the twenty-six recorded and all had settled within one week. The erythrocyte sedimentation rate was elevated on admission in eighteen of the twenty-six recorded and all had returned to normal limits within five weeks. There was no recurrent illness which seemed to predispose to acute septic arthritis.

Pus was cultured from twenty-seven patients, in only ten were organisms isolated. Blood cultures were carried out on twenty patients, only two of which were positive. A total of eleven organisms were isolated and their sensitivity determined. Table III.) The antibiotics used in treatment varied but the majority of patients

TABLE III

Organism and antibiotic resistance

Organism	*Number of cases*	*Antibiotic resistance*	*Number of cases*
		sensitive	3
STAPHYLOCOCCUS AUREUS	6		
		penicillin and ampicillin	3
COLIFORM SPP.	3	penicillin, cloxacillin, fusidic acid.	3
HAEMOPHILUS INFLUENZAE	1	penicillin and sulphonamides.	1
PNEUMOCOCCUS	1	sensitive	1

were treated with a combination of ampicillin and cloxacillin. The only poor result was treated with tetracyclines for one week and then changed to benzylpenicillin. Only seven patients were recorded as having instillation of antibiotic initially, all were given intra-articular benzylpenicillin and very few had repeated instillations. However the regime adopted at this time entailed repeated intra-articular instillations and this low number may only reflect the failure to record this type of treatment. The average length of antibiotic treatment was five and one half weeks.

Open surgical drainage was carried out in four hips, one knee and one elbow. All were reported as containing thick pus and coagulum despite previous needle aspiration. There was one patient who developed a wound abscess which necessitated drainage. In no case was surgery considered to have caused harm.

There was only one case out of the twenty-nine in which there was a failure of treatment. This one month old child was seen in the Casualty Department with an abscess at the base of the right middle finger. Pre-auricular lymphadenitis was also noted. The abscess was drained and the child sent home. Two days later at review, the child's temperature was 38°C and further swelling was noticed in the left groin. The child was admitted to a medical ward where it was found to be ill-looking with a greyish pallor. Both hips were irritable and there was an inflamed fluctuant swelling in the left groin. Blood cultures were taken, the child was commenced on tetracyclines and a surgical opinion sought. Later that day the hip joints were formally explored and thick pus drained from both. Culture revealed a *Staphylococcus aureus* sensitive to all common antibiotics. Radiographs revealed reactive bony changes at the upper end of both femurs and both pubic rami. (Fig. 1). At eight days the temperature had not settled, tetracyclines were stopped and benzylpenicillin substituted. This was continued for

FIG. 1. *Radiograph revealing bilateral septic arthritis with bone changes in pelvic bones and both femurs.*

three months. One year after when the child was beginning to walk radiographs showed gross destruction and dislocation of both hips. Fours years later, there was

still no evidence of continuing bone infection but both hip joints were still grossly disorganised. (Fig. 2).

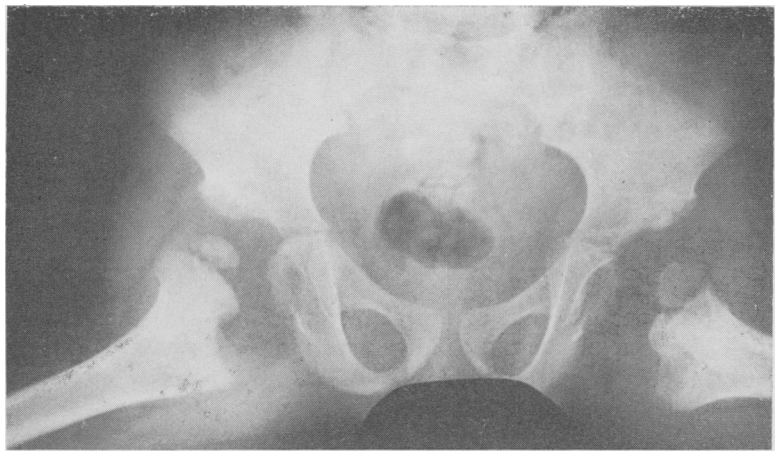


FIG. 2. *Radiograph five years later showing grossly disorganised hip joints.*

Five patients showed continued radiological changes in an adjacent epiphysis after adequate treatment. In none of the cases was this associated with any functional deficit despite constant follow-up examinations. A radiographic example shown. (Fig. 3). Although the numbers are small all patients with radiological epiphyseal changes were under the age of one year.

FIG. 3. *Radiograph of a defect in the right capital epiphysis after a two year period. There was no functional deficit or evidence of continuing bone infection.*

Late orthopaedic complications consisted of the patient already described with bilateral dislocation of hip and one patient with radiological evidence of epiphyseal damage of one hip and subsequent shortening of the leg. There were no cases of joint ankylosis.

Discussion

In this series the most striking finding was the very low incidence of a precise bacteriological diagnosis. There was a very poor isolation rate for pus culture and only two blood cultures were positive. It is well known that pus is inhibitory to bacteria but other published series have a much higher diagnostic rate (Lidgren and Lindberg, 1973; Nelson, 1972; Ruedy, 1973.) Bacteriological specimens must not have been adequate. Under the age of two years this disease is caused by a great variety of agents and precise aetiological diagnosis is imperative so that adequate antibiotic cover can be given as soon as possible. Direct gram stains should be carried out to differentiate between gram positive cocci and gram negative rods. Pus specimens should be sent for both aerobic and anaerobic culture remembering that *Haemophilus influenza* requires enriched media and sophisticated bacteriological techniques (Wall and Hunt, 1968). A pus culture which is negative should alert one to the possibility of Bacteroides. This group has a mean isolation time of 6.5 days and should be incubated for at least three weeks (Ament, 1967). Thus antibiotic treatment must be on a "best guess" footing until baceriology is established. Coliforms may be resistant to ampicillin and either gentamycin or kanamycin may be substituted. Over the age of two years there is a great increase in isolation of *Staphylococcus aureus* and there is now no reason why a β-lactamase resistant penicillin cannot be used as a first choice drug.

Antibiotic therapy alone is quite insufficient. Application of the surgical principle of drainage of pus is essential to minimise the articular damage, to decrease intra-articular pressure and to increase antibiotic effectiveness. In our series needle aspiration was found to be effective in all but the hip joint, However, in any joint, if doubt exists as to the efficiency of drainage it is better to formally explore the joint than to leave it full of pus. The anatomy of the hip joint makes it quite different from all the other commonly involved joints. Aspiration is difficult and adequate drainage of thick pus is difficult by needle aspiration. The added diagnostic difficulty of differentiation from acute osteomyelitis of the femoral neck means that formal surgical exploration of the hip should be very carefully considered (Gillespie, 1973; Goldenberg et al 1967).

The frequency of intra-articular instillation of antibiotics was very difficult to assess in this series. Clawson and Dunn (1967) recommend intra-articular injection, but effective concentrations of antibiotics have been shown to be present in an infected joint during systemic chemotherapy (Parker and Schmid, 1971). Series are reported where good clinical results are obtained without intra-articular injection (Russell and Ansell, 1972; Ruedy, 1973 and Nelson, 1972). However warning has been given of a chemically induced synovitis following intra-articular therapy (Argen et al 1966). It would appear that, if an infected joint is adequately drained

either by needle aspiration or surgery, systemic antibiotics provide adequate levels in the joint space and that injection of antibiotics into the joint may expose the cartilage to further risk of damage. This problem demands further investigation.

There is always the danger of pathological dislocation especially in the hip joint and splintage is mandatory. The Forrester-Brown splint is particularly useful in preventing this complication in the hip joint.

Radiological changes in the absence of infection persisting after the acute episode may include epiphyseal lysis. This does not appear to effect the short term prognosis for the joint, because if followed radiologically the epiphysis will reappear. Long term follow-up will be essential to assess the true damage to the joints involved.

We must always be alert to the diagnosis and remember that more than one joint can be involved at any one time. Adequate treatment means early precise bacteriological diagnosis, adequate drainage of the joint, if necessary a formal exploration, and bacteriocidal antibiotics in effective dosage. Adequate splintage is mandatory to prevent dislocation. The result of failure to appreciate these factors is still orthopaedic disaster.

Summary

Twenty-nine cases of proven acute haematogenous septic arthritis are reviewed. The clinical features are described and results are discussed. The need for a precise bacteriological diagnosis is discussed and recommendation is given for antibiotic cover. Needle aspiration was found adequate for all joints, however surgical drainage may be considered necessary especially for the hip joint. Splintage is mandatory to prevent dislocation and epiphyseal damage.

References

Ament, M. E., and Gaal, S. A. (1967) *American Journal of Diseases of Children*, **114**, 427.

Argen, R. J., Wilson, C. H., and Wood, P. (1966) *Archives of Internal Medicine*, **117**, 661.

Clawson, D. K., and Dunn, A. W. (1967) *Journal of Bone and Joint Surgery*, **49A**, 164.

Gillespie, R. (1973) *Clinical Orthopaedics and Related Research*, **96**, 152.

Goldenberg, D. L., Brandt, K. D., Cohen, A. S., and Cathcart, E. S. (1975) *Arthritis and Rheumatism*, **18**, 83.

Lidgren, L., and Lindberg, L. (1973) *Acta Orthopaedica Scandinavica*, **44**, 263.

Nelson, J. D. (1972) *Paediatrics*, **50**, 437.

Parker, R. H., and Schmid, F. R. (1971) *Arthritis and Rheumatism*, **14**, 96.

Ruedy, J. (1973) *Clinical Orthopaedics and Related Research*, **96**, 150.

Russell, A. S., and Ansell, B. M. (1972) *Annals of the Rheumatic Diseases*, **31**, 40.

Wall, J. J., and Hunt, D. D. (1968) *Journal of Bone and Joint Surgery*, **50A**, 1657.

ACTIVE CHRONIC HEPATITIS: Part 2*

by

TERENCE FULTON, M.D., F.R.C.P.

and

VINCENT J. McCANN, M.D., M.R.C.P.**
Royal Victoria Hospital

** Now Associate in Medicine, Royal Perth Hospital, Perth, Western Australia

TREATMENT

THE belief that an immunological mechanism is involved in the chronic inflammatory process in the liver led to the use of corticotrophin and corticosteroid therapy for active chronic hepatitis as early as the 1950's (Waldenström 1950, Bearn, Kunkel and Slater 1956, Mackay, Taft and Cowling, 1956). However disagreement over the indications for treatment, doubts about its real value and concern about possible side-effects continued until the 1960's when gradually a consensus developed in favour of treatment (Page, Condie and Good 1964, Mackay, Weiden and Ungar 1964, Mistilis and Blackburn 1967). In a prospective trial the Copenhagen Study Group for Liver Diseases (1969) analysed the effects of prednisone in a dose of at least 10 mg daily given to 169 patients with cirrhosis and showed that the death rate in female patients without ascites was significantly lower than in the control group. It was assumed that prednisone exercised its beneficial effect in "patients with 'active' cirrhosis particularly at the early stages." This conclusion was confirmed in a second report (1974) on the effect of prednisone in improving the survival of female patients with compensated non-alcoholic cirrhosis. The controlled prospective trial of corticosteroid therapy in active chronic hepatitis by Cook, Mulligan and Sherlock (1971) also clearly showed that corticosteroids were of value in improving life expectancy in the active phase of the disease, during the first two or three years. The realisation that the end result of continuing aggressive hepatitis was almost invariably cirrhosis and that many cases of cryptogenic cirrhosis probably represented the late stage of unrecognised active chronic hepatitis (Sherlock 1974) give hope for long-term benefits from effective treatment.

Criteria for Treatment

Summerskill, Ammon and Baggenstoss (1974) proposed that treatment should be given to patients with—

1. histologically proven subacute hepatitis regardless of clinical or biochemical features,
2. histologically confirmed active chronic hepatitis with "clinically evident and serious deterioration in liver function or with disabling symptoms",

---

* Part 1 appeared in *Ulster Medical Journal*, **45**, 84 (1976).

3. active chronic hepatitis with a continuing 10-week elevation of serum GOT to x 10 normal or above, or x 5 normal in association with serum gamma-globulin x 2 normal,
4. active chronic hepatitis in whom the beneficial results of treatment seemed likely to outweigh its deleterious effects, keeping in mind the potential of relatively mild active chronic hepatitis to deteriorate or progress to cirrhosis.

Sherlock (1975) considers that treatment should probably also be given to patients with histologically proved active chronic hepatitis and a six month history of liver disorder even though symptoms may be absent or mild and biochemical tests only modestly impaired. It seems unlike that Plotz would agree (1975).

In the Liver Clinic at the Royal Victoria Hospital it has been our policy since the early 1960's to treat positively all patients in whom a firm diagnosis of HB_sAG negative active chronic hepatitis was made because of the very evident immediate benefits and the subsequent improvement in the quality of life resulting from corticosteroid and corticotrophin therapy.

Mechanisms of action

Uncertainty continues as to the relative importance of the differing modes of action of the immunosuppressive drugs corticotrophin, the corticosteroids, azathioprine and 6-mercaptopurine used in the treatment of active chronic hepatitis i.e. their effects on humoral and cellular immunity and any coexisting anti-inflammatory properties. Their intermediate metabolism in the liver is also of considerable importance. In patients with active liver disease the conversion of prednisone to the biologically active corticosteroid prednisolone is known to be impaired (Powell and Axelsen 1972). The fall in serum albumin levels with resulting reduction of prednisolone binding is however responsible for higher plasma levels of unbound circulating prednisolone. Whether in treatment it is preferable to maintain fairly constant levels of unbound steroid in the plasma or to produce very high levels intermittently, for example by the use of alternate day double-dose regimes (Powell and Axelsen 1972) remains a matter for discussion.

The conversion of azathioprine to 6-mercaptopurine, its active metabolite, may be seriously impaired in the presence of parenchymal disease of the liver so that little immunosuppressive activity may be found in the blood. This may well explain the poor results following its use alone in the treatment of active chronic hepatitis (Mistilis and Blackburn 1970, Whelan and Sherlock 1972, Murray-Lyon, Stern and Williams, 1973).

Schedules of Treatment

Many different therapeutic programmes using prednisone, prednisolone and azathioprine have been proposed. In that favoured by Mistilis and Blackburn (1970) prednisone was commenced in a dose of 60 mg per day together with azathioprine 25 – 50 mg daily. Over a period of six weeks the daily dose of prednisone was gradually reduced to 10 mg while that of azathioprine was increased

to between 50 and 100 mg. They found it desirable and often possible later to slowly and completely withdraw corticosteroid therapy while continuing to give azathioprine in a daily dose of between 25 and 150 mg. They emphasised the need for flexibility in both drug and dosage schedules, pointing out that patients may require an increase in azathioprine dosage or the addition of steroids to suppress exacerbations of the disease. They recommended that carefully controlled treatment should be continued until the disease was quite inactive.

The Copenhagen Study Group for Liver Diseases recommended the administration of prednisone in a daily dose of 15 – 20 mg for the first few months then, depending upon the needs of the individual patient, gradually reducing to a maintenance dose of little more than 10 mg per day. Male patients with compensated non-alcoholic cirrhosis, when compared with the control group, did not show any significant benefit from treatment and it was recommended that routine treatment of such patients with steroids should not be undertaken but should be the subject of further investigation.

Cook *et al* (1971) commenced treatment with 15 mg of prednisolone daily and reduced the dose whenever biochemical tests of liver function became normal or if serious side-effects developed. They suggested that corticosteroid therapy should be adjusted, on the basis of serum total globulin and albumin levels, during the first two or three years of the illness and should not be discontinued unless this was made necessary by severe toxic effects, until both serum albumin and total globulin concentrations were within the normal range.

Summerskill *et al* (1974 and 1975), on the other hand, recommended the use of fixed schedules of daily dosage in preference to "dose titration" upwards or downwards depending upon clinical response, changes in liver function tests, etc. Patients treated with prednisone alone received 60 mg daily for one week, 40 mg daily for one week then 30 mg daily for two weeks before reaching a maintenance dose of 20 mg daily. Patients on the combined treatment programme received azathioprine 50 mg daily together with prednisone 30 mg daily for one week, 20 mg daily for one week, 15 mg daily for two weeks and then a maintenance dose of 10 mg daily. The aim of treatment was a complete remission followed by the gradual withdrawal of both drugs over a six weeks period.

In the Liver Clinic at the Royal Victoria Hospital the initial and maintenance doses of the various agents were determined by the condition of each patient and "dose titration" upwards or downwards was employed. Prednisolone was used in preference to prednisone and the initial daily dose, which varied between 20 and 90 mg, was usually 40 to 45 mg. After two weeks, and provided the response was satisfactory, the dose was reduced to 30 mg daily for one to two weeks, then to 20 mg daily for two weeks and 15 mg daily for approximately four weeks. After further gradual reduction of dosage over a variable period of time a maintenance dose was reached which differed considerably from patient to patient, the range being 2.5 – 20 mg with an average of 7.5 mg per day.

In 1970 treatment with corticotrophin was commenced with the aim of preserving adrenal responsiveness in the hope that when a complete remission of the

disease occurred treatment could then more safely be withdrawn. In addition it was considered likely that the incidence and severity of side-effects would be less than with prednisolone. The plasma cortisol response to corticotrophin stimulation in patients with active chronic hepatitis was found by McCann (1973) to be essentially similar to that in asthmatics in whom injection of 40 units of Acthar gel at 10 p.m. caused a rise in mean plasma cortisol to 46 micrograms/100 ml. at seven hours with return to pre-treatment levels within 24 hours. Random estimations of plasma cortisol levels in patients with active chronic hepatitis receiving treatment with Acthar gel confirmed this pattern. Although no fixed regime of treatment with corticotrophin was used there was a modest degree of uniformity. Most patients received intramuscular injections of Acthar gel between 10 and 11 p.m. on five to seven successive evenings and a number received 40 units morning and evening over this period. Then followed reduction to 40 units on three evenings per week for perhaps two or three months when the dose was further reduced to 40 units twice weekly and this was continued for an average of nine months. Maintenance doses ranged from 20 units once a week to 40 units three times weekly, an average dose being 30 units twice weekly. Patients were shown how to give their own injections and this made possible the late evening administration of Acthar gel to cause maximum adrenocortical stimulation during the normal resting phase of the gland.

Response to Treatment

The effects of corticotrophin and corticosteroids were exactly similar in those patients, the great majority, who responded favourably to such treatment. Within 24 hours fever disappeared and a sense of wellbeing began to replace the malaise which was such a prominent feature in over one-third of the cases. Fatigue gradually lessened and energy returned. With the exception of acne, skin rashes rapidly faded and arthralgia disappeared. Vomiting was quickly controlled, appetite gradually returned and after two or three weeks nausea and abdominal discomfort had gone. Within two or three days of commencing treatment jaundice began to lighten but it took several weeks or months for it to disappear completely. Hepatic tenderness was gone within the first week and usually enlargement of the liver and spleen resolved within seven or eight weeks but a few patients had persistent hepatomegaly and splenomegaly. In three women normal periods were re-established two months, four months and twelve months after the commencement of treatment but in the fourth amenorrhoea continued for the remaining eight years of her life.

Serum albumin was the biochemical parameter showing the earliest return to normal, on average within two to three months, evidence of the stimulus to albumin synthesis caused by corticotrophin and corticosteroids and also of the restoration of liver cell function resulting from effective treatment of the hepatic disorder. It took an average of three to four months for the ESR to return to normal and four to five months for restoration of the serum bilirubin, pseudocholinesterase and alkaline phosphatase levels. In the majority of patients, whether treated with corticosteroids or corticotrophin, the SGOT had returned to the normal range in six months whereas the SGPT took on average nine months. Gammaglobulin levels remained elevated for approximately two years.

The aim of treatment, according to Summerskill *et al* (1974), is complete remission characterised by absence of symptoms, return to all normal activities, disappearance of chemical and immunochemical abnormalities associated with active chronic hepatitis and resolution of the histological hallmarks of the disease. A persisting elevation of SGOT to less than twice normal is regarded as being consistent with remission, as is the presence of residual or inactive hepatitis characterised by round cell infiltration of the portal tracts with minimal or no hepatic cell necrosis. They point out that these chemical and histological abnormalities are indistinguishable from chronic persistent hepatitis to which a proportion of patients with successfully treated active chronic hepatitis are thought to remit.

In the Royal Victoria Hospital series, unlike that reported by Summerskill *et al,* histological evidence of remission by serial liver biopsies was not sought partly because of a disinclination to extend the routine use of a painful and invasive procedure and partly because of the known variability in the appearances of different areas of the liver. It was for this reason that Cook *et al* did not attempt the evaluation of serial biopsies in assessing the effects of corticosteroid therapy in their patients.

Seventeen of our forty patients experienced a complete remission characterised by disappearance of all symptoms, signs and biochemical abnormalities of active chronic hepatitis. This occurred in less than one year in only nine patients, in one to two years in two patients, in two to three years in three patients and in three to four years in two patients, the average overall being 19 months. In nine patients persistent slight elevations of ESR, gammaglobulin, transaminases or alkaline phosphatase indicated that their response fell short of complete remission. Another six patients showed a good clinical response to treatment but improvement of only some of the disturbed liver tests. In seven patients a degree of symptomatic improvement followed the institution of treatment but the clinical and laboratory findings were largely unaffected. These and the one patient in the series who showed no response whatever resemble Summerskill's "treatment failures" amounting to approximately 20 per cent of all patients. Persistent jaundice or even subclinical elevation of serum bilirubin, continuing very high serum alkaline phosphatase levels and unremitting hypergammaglobulinaemia are the usual indicators of an unresponsive and progressive disorder which almost certainly has already progressed to cirrhosis.

Complications of Treatment

Twenty-five of the 40 patients experienced complications, details of which are shown in the Table, but in only seven were they severe (Treadwell *et al* 1964). Two patients developed vertebral osteoporosis and one of them sustained collapse of several of the vertebral bodies in the lower dorsal and lumbar regions. Pre-existing diabetes was aggravated in two patients and in one of them it was necessary to discontinue treatment with corticotrophin and rely solely on azathioprine. A third patient developed mild persistent diabetes which was readily controlled by diet alone. One of 2 patients with ulcer-type epigastric pain suffered perforation of a chronic duodenal ulcer and required emergency surgery.

TABLE

Complications of treatment in 40 patients with active chronic hepatitis

	ACTH (22)	*Prednisolene* (15)	*Betamethasone* (3)	*Total* (40)
Facial mooning	6	8	1	15
Hirsutism	6	1		7
Thinning of scalp hair		2		2
Acne caused or aggravated by treatment	3	4		7
Excessive weight gain	2	2		4
Hyperglycaemia	5	2		7
Persistent		(1)		
Transient	(3)	(1)		
Diabetes worsened	(2)			
Bruising		3		3
Vertebral osteoporosis	1		1	2
Muscle aching	4			4
Hypertension	1			1
Oedema	3	3		6
Ascites		2		2
Insomnia, tension or hallucinatory state	1	1		2
Dyspepsia		1	1	2
Fungus infection		3		3

The other complications, while of concern to the sufferers, were inconvenient or unsightly rather than dangerous. Patients with chronic liver disease, particularly women, are especially sensitive to corticosteroids and corticotrophin and suffer side-effects more frequently and severely than do patients on similar dosage for other conditions. However withdrawal of treatment because of complications was rarely necessary and we share the view that complications of treatment are far outweighed by its benefits.

RELAPSES

During the period of follow-up at the Liver Clinic ranging from four months to 13 years 26 of the 40 patients have undergone a total of 58 relapses. Thirty-five of these occurred during the course of treatment with corticotrophin or one of the corticosteroids. Sixteen followed reduction of dosage below that required to maintain complete or stable partial remission. In 4 other instances it was considered that patients had been kept on too low a maintenance dose for some time before symptoms of the relapse developed. Intercurrent infections such as influenza, tonsillitis, otitis media, bronchitis, pneumonia, gastroenteritis and pyelitis appeared to be responsible for precipitating seven relapses though two patients were probably also receiving inadequate maintenance doses of prednisolone. One patient developed a florid lupus erythematosus rash following prolonged exposure to the sun. No cause was found for the remaining seven relapses.

Twenty-three of the 58 relapses occurred at intervals of from one week to several years after treatment with corticotrophin or corticosteroids had ceased. In those instances in which the relapse was probably due solely to premature withdrawal of treatment symptoms commenced within three months in 12 out of 23 and within one year in 19 out of 23. This corresponds to the experience of Sherlock (1974) and Summerskill (1974). In four instances however the relapses occurred 2, 2½, 4 and 12 years after all treatment had stopped. Intercurrent infection, usually involving the respiratory tract, probably played an important part in precipitating four of the 23 relapses while prolonged exposure to sunlight during the long hot summer of 1975 twice caused relapses typical of systemic lupus erythematosus without evidence of liver cell damage.

The great majority of the relapses were purely hepatic in type (44 out of 58). Some of these took the form of an acute illness closely resembling virus hepatitis with fever, sickness, deep jaundice and hepatic enlargement and tenderness. Some were insidious in onset with fatigue, debility, an indifferent appetite, loss of weight and ultimately darkening of the urine and overt jaundice. The remaining six patients with hepatic relapses were all symptomless but were found to have developed appreciable disturbances of their liver tests when they attended the Liver Clinic for routine reassessment.

The symptoms in six of the 58 relapses were characteristic of episodes of systemic lupus erythematosus and included a florid skin rash, polyarthralgia, tachycardia and occasionally pyrexia but there was no disturbance of the liver tests. The remaining eight relapses were of mixed type with skin rash, polyarthralgia and features of active hepatitis.

The inherent tendency to reactivation at any stage during the whole course of active chronic hepatitis is exemplified by the timing of the 58 relapses that occurred in the 26 patients who experienced relapses. Nineteen relapses occurred during the first two years of the illness, 12 between the third and fifth years, 15 between the sixth and tenth years and no less than 12 between the eleventh and sixteenth years. Of the 26 patients who suffered relapses eight did so within the first year of their illness, 15 within the first two years and 21 by the end of the fifth year but for the other five patients their first relapse still lay one to five years ahead.

Response of Relapses to Treatment

Many of the relapses responded quickly to the recommencement or augmentation of corticosteroid or corticotrophin therapy in full dosage but there was inevitably a proportion of treatment failures. Seven of the original twelve patients who had had a complete remission and had subsequently relapsed again achieved a complete remission as a result of a second course of treatment but five failed to do so, though they also became symptom-free and regained reasonable health. Often the only clinical signs during the inactive phase of the disease were mild facial venectasia and slight firm, painless enlargement of the liver. Mistilis and Blackburn (1970) noted that in some patients the only biochemical evidence of liver disease was a slightly reduced serum albumin level and varying degrees of

BSP retention but we would feel that in many there is also a degree of hypergammaglobulinaemia and in some a modest increase in SGPT. Relapses occurring later in the course of the disease usually showed an increasingly delayed response to treatment and eventually overt clinical signs of liver cell failure appeard. Many if not all of the patients in the later stages of the disease have cirrhosis and its complications often necessitate hospital admission.

Mortality

During the years 1961 – 1975 eight of the 40 patients with active chronic hepatitis died and four further deaths have occurred during the first six months of 1976. Two patients died during the second year of their illness, one each during the fifth, sixth and seventh years, two during the eighth year and one each during the ninth, twelfth, thirteenth, fourteenth and nineteenth years after the onset of active chronic hepatitis. Six patients with macronodular cirrhosis, portal hypertension and liver cell failure died in hepatic coma which in two patients was precipitated by pneumonia. One patient with macronodular cirrhosis and liver cell failure died of septicaemia. Uncontrollable diabetic ketoacidosis caused the death of a patient with advanced cirrhosis and chronic hepatic encephalopathy. One patient died of pulmonary embolism three weeks after a successful transection of the oesophagus for varices. The other three deaths were due to cerebral thrombosis, coronary thrombosis and acute left ventricular failure respectively.

Discussion

Since 1950 the concept of active chronic hepatitis has gained general acceptance and its importance as a major cause of cryptogenic cirrhosis has been recognised. The wide pathological and clinical spectrum of the disease has been established and the conspicuous immunological changes have been noted. Treatment with a variety of immunosuppressive and anti-inflammatory agents has been shown to result in striking symptomatic improvement and restoration to normal of many of the clinical findings and biochemical indices of the liver disorder. Prospective controlled trials have proved that effective treatment results in improvement in both the quality and length of life. In most centres treatment with one of the corticosteroids, usually prednisolone, is commenced in moderately high dosage which is then quickly reduced to maintenance levels and adjusted to the clinical, biochemical and haematological responses of the individual patient. These responses are the criteria usually employed in judging that a satisfactory remission has occurred. Treatment is then continued in the smallest dose that will control the disease process. If troublesome side-effects of treatment arise it may be possible to reduce the dose of prednisolone further by adding azathioprine in low dosage (50 mg per day). Sherlock (1974) recommended that therapy should be continued for six months after the liver tests have returned to normal, then slow withdrawal of prednisolone should be attempted while the patient is closely observed for signs of relapse. Steroid therapy does not induce permanent remission and it is the experience of most centres that even after two or three years' treatment the majority of patients will relapse after it is withdrawn, usually within the first year. Most patients require lifelong treatment (Murray-Lyon and Eddleston 1973).

The discovery that during a complete remission resulting from successful treatment the histological abnormalities of active chronic hepatitis may disappear or revert to those of chronic persistent hepatitis led Summerskill and his colleagues (1974) to adopt a much more aggressive approach to treatment. The use of moderately high fixed maintenance doses of prednisone (20 mg/day) for prolonged periods inevitably caused a higher incidence of serious complications of treatment but this was regarded as an acceptable price to pay for the improved prospects of achieving a complete clinical, biochemical, immunochemical and histological remission. Combined treatment with moderate fixed doses of prednisone (10 mg/day) and low dose azathioprine (50 mg/day) was found to be equally effective with fewer and less severe side-effects. Both of these regimes of treatment caused histological remission significantly more frequently than did prednisone used in the alternate day double-dose regime. In spite of these encouraging results however relapses following the gradual withdrawal of treatment still occurred in approximately 50 per cent of patients.

Treatment with corticotrophin has proved very satisfactory and despite the fact that patients have been receiving or giving themselves injections regularly for long periods there has been no patient resistence to the treatment. Fewer serious complications occurred in the group of patients treated with corticotrophin than in those receiving corticosteroids and the presence of a fully responsive adrenal cortex is reassuring. Ultimately the treatment of choice will be that which, without causing an unacceptably high incidence of serious side-effects, offers the best hope of preventing or delaying the development of cirrhosis.

Summary

The responses of 40 patients with HB_sAG negative active chronic hepatitis to treatment with corticosteroids, mainly prednisolone, or corticotrophin have been observed and evaluated at the Liver Clinic over a period of from four months to 13 years. In the great majority marked symptomatic improvement and disappearance or modification of the clinical features of active hepatitis occurred together with biochemical evidence of decreased liver cell necrosis, increased excretory capacity and improved synthetic function. The responses to corticotrophin and corticosteroids were indistinguishable except for differences in side-effects. Seventeen of the patients underwent complete remission, and in another fifteen patients remission, though incomplete, was clinically satisfactory. Numerous relapses occurred both while treatment was being given and throughout the years following its withdrawal.

The intensity of continuing liver cell damage is greatest during periods of activity of the disease with consequent encroachment on hepatic functional reserve and increasingly severe architectural distortion resulting in cirrhosis and the development of portal hypertension. Having established a firm diagnosis therefore the principal aim of management must be to attempt with effective treatment to promote a complete remission as quickly as possible then, by careful review and reassessment, to foresee and forestall any subsequent tendency to relapse. Prolonged treatment is essential and only after all clinical, biochemical and haematological features have returned to normal should its very gradual withdrawal be

contemplated. Further relapse calls for recommencement of treatment in full dosage and there is a strong case for lifelong therapy unless the most stringent criteria for complete remission including serial liver biopsies are adopted.

Among the most effective regimes of treatment available at present are prednisolone and the combination of prednisolone and low dosage azathioprine, the latter having the advantage of fewer and less severe side-effects. It is anticipated that combined treatment with Acthar gel and low dosage azathioprine would be equally effective and may have an even lower incidence of side-effects while also preserving adrenal responsiveness. The ultimate choice will depend at least partly on the personality and constitution of the patient, the presence of other diseases such as severe diabetes, hypertension, duodenal ulcer and major psychiatric illness and also on the availability and cost of corticotrophin.

Acknowledgements

We are again indebted to Mrs. Ann Sullivan and Miss May Weller for secretarial assistance.

References

Bearn, A. G., Kunkel, H. G., and Slater, R. J. (1956). *American Journal of Medicine*, **21**, 3.

Cook, G. C., Mulligan, R., and Sherlock, S. (1971). *Quarterly Journal of Medicine*, **40**, 159.

Copenhagen Study Group for Liver Diseases (1969). *Lancet*, **1**, 119.

Copenhagen Study Group for Liver Diseases (1974). *New England Journal of Medicine*, **291**, 271.

McCann, V. J. (1973). *M.D. Thesis. Queen's University of Belfast.*

Mackay, I. R., Taft, L. I., and Cowling, D. C. (1956). *Lancet*, **2**, 1323.

Mackay, I. R., Weiden, S., and Ungar, B. (1964). *Lancet*, **1**, 899.

Mistilis, S. P., and Blackburn, C. R. B. (1967). *Australasian Annals of Medicine*, **16**, 305.

Mistilis, S. P., and Blackburn, C. R. B. (1970). *American Journal of Medicine*, **48**, 484.

Murray-Lyon, I. M., Stern, R. B., and Williams, R. (1973). *Lancet*, **1**, 735.

Murray-Lyon, I. M., and Eddleston, A. L. W. F. (1973). *Journal of the Royal College of Physicians of London*, **8**, 37.

Page, A. R., Condie, R. M., and Good, R. A. (1964). *American Journal of Medicine*, **36**, 200.

Plotz, P. H. (1975). *Gastroenterology*, **68**, 1629.

Powell, L. W., and Axelsen, E. (1972). *Gut*, **13**, 690.

Sherlock, S. (1974). *Gut*, **15**, 581.

Sherlock, S. (1975). *Diseases of the Liver and Biliary System*, Fifth edition, Oxford: Blackwell.

Summerskill, W. H. J., Ammon, H. V., and Baggenstoss, A. H. (1974). In *The Liver and Its Diseases*, ed. F. Schaffner, S. Sherlock and C. M. Leevy. New York: Intercontinental Medical Book Corp.

Summerskill, W. H. J., Korman, M. G., Ammon, H. V., and Baggenstoss, A. H. (1975). *Gut*, **16**, 876.

Treadwell, B. L. J., Sever, E. D., Savage, O., and Copeman, W. S. C. (1964). *Lancet*, **1**, 1121.

Waldenstrom, J. (1950), quoted by Goldgraber, M. B., and Kirsner, J. B. (1959). *Archives of Internal Medicine*, **104**, 469.

PERFORATED PEPTIC ULCER AND THE CIVIL DISTURBANCES IN BELFAST 1967 - 74

by

S. A. COMPTON, N. K. COOPER, R. J. CLYDE, J. S. A. COLLINS and CATHERINE M. FRIEL

Prepared when Final Year Medical Students, Department of Social and Preventive Medicine
Queen's University, Belfast

This study was carried out as part of our Fifth Year Community Medicine Clerkship

INTRODUCTION

THE role of stress in the aetiology of perforated peptic ulcer in the civilian population was reported upon during the Second World War by Stewart and Winser (1942) who demonstrated a marked increase in admissions to London hospitals for this condition during the heavy air-raids of the 1940 blitz on London. The civil disturbances in Northern Ireland during the last six years have produced a considerable amount of anxiety in the population as documented by Lyons in 1973, and if stress is a significant factor in the aetiology of perforated peptic ulcer then we would have expected an increase in the incidence of this condition during this period.

We therefore examined the case records of all patients with a discharge diagnosis of perforated peptic ulcer, resident in Belfast and admitted during the years 1967—1974 to any of the five Belfast general hospitals—the Royal Victoria Hospital, Belfast City Hospital, Ulster Hospital Dundonald, Musgrave Park Hospital and Mater Infirmorum Hospital which dealt with emergencies during this period.

The age, sex and social class distributions of peptic ulcer have varied widely over the years; Osler (1901) for example stated that "servant girls seem particularly prone" to peptic ulcer and in a large series he found that 60 percent were in women. He also stated that " the acute perforatory form was much more common in women".

Consecutive Registrar General's Reports show that deaths from perforated peptic ulcer in England and Wales have decreased following a peak in the 1950s. The Mortality Rate from Peptic Ulcer (ICD Nos. 531-533) for males though not for females appears to be declining slightly in England and Wales during the years 1968—1972 inclusive (Registrar General 1972) and recent data abstracted from the latest Hospital In-patient Enquiry and published by Brown, Langman and Lambert (1976) show that the frequency of admissions for both perforated and non-perforated peptic ulcer has fallen over the years 1958—1972 in Scotland and England and Wales.

In our study we set out to test the null hypothesis that the civil disturbances have not affected the numbers of perforations admitted to the five major Belfast hospitals in the years 1967—1974. It has been assumed that practically all patients with perforated peptic ulcer occuring in Belfast will have been admitted to one of these hospitals during the period under study. Our results show no clear cut trend and are consistent with the view that the situation in Northern Ireland has not produced a significantly differently pattern of morbidity from that obtaining in England and Wales.

Method

The conditions we investigated are defined in the International Classification of Disease (1965) as:—

Perforated gastric ulcer — ICD No. 531.0
Perforated duodenal ulcer — ICD No. 532.0
Perforated peptic ulcer — ICD No. 533.0

Serious civil disturbances started during the summer of 1969 so we included admissions for the years 1967 and 1968 as controls. A register was compiled with spaces to cover age, sex, social class, religion, ICD No. postal area of home address, hospital of admission and date of admission. The register was so arranged that results could be filled in as a number code to aid data processing and analysis.

Results

There were 527 cases admitted to the five hospitals during the years 1967—1974; 11 per cent had perforated gastric ulcers, 87 per cent perforated duodenal ulcers and 2 per cent were classified as perforated peptic ulcers. The distribution of the 527 patients was 81 per cent male and 19 per cent female.

The table shows admissions by year together with rates per million of the Belfast population. This was done to eliminate effects due to the changing totals

Table

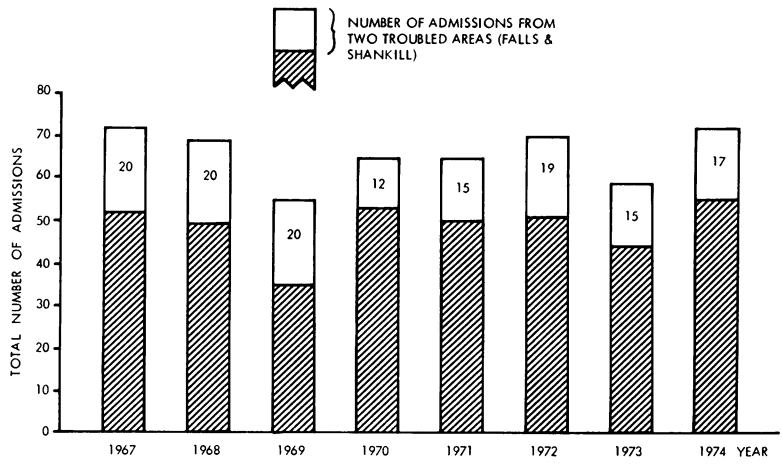
Hospital admissions for perforated peptic ulcer in Belfast, population of Belfast and rates per million population 1967–1974

	1967	1968	1969	1970	1971	1972	1973	1974
All Belfast (n-527)	72	69	55	65	65	70	59	72
*Population	398500	390700	385900	383600	360200	362400	353700	(353700)
Rates/Mill. popn.	181	177	143	169	180	193	167	204
Mean Rate/Mill. popn.	179		176					

*Apart from the census year 1971 the population figures are RG's estimates.
No figure available for 1974 owing to boundary changes; 1973 estimate used.

of the city's population which were estimated by the Registrar General of Northern Ireland to have taken place during this period. The figure is a histogram of the yearly totals for the whole city and for the districts most affected by the civil disturbances namely those of the Falls and Shankill. It will be seen that the number of perforations during the troubles has not exceeded the pre-1969 figure.

HOSPITAL ADMISSIONS FOR PERFORATED PEPTIC ULCER IN BELFAST 1967-1974



We compared the distribution by Registrar General's Social Class of the 326 Royal Victoria Hospital patients with the distribution of all admissions to the Royal Victoria Hospital by Social Class for the period under study and found that Classes IV and V were over-represented in our series and Classes I and II under-represented.

We found no significant difference in the distribution of cases between Catholics and non-Catholics over the eight years; 34 per cent of the Belfast population (according to the 1971 Government Census of Northern Ireland) and 30.3 per cent of the 402 patients whose religion could be ascertained were Catholics.

Discussion

The evidence for the relationship between stress and perforated peptic ulcer is most clear-cut in Stewart and Winser's 1942 paper. They examined the case records of perforated ulcer patients admitted to 16 London hospitals for the years 1937 to 1940 and found an increase equal to four times the mean standard deviation of the monthly totals during September and October 1940 which corresponded to the time of the blitz. The monthly average for September and October during the years 1937—1939 was 23, but in 1940 the admissions for each of these months averaged 64. Later Spicer, Stewart and Winser (1944) continued the study by examining the case records for the 18 month period following the blitz and found that the rate of admissions had dropped back to pre-blitz levels. This would strengthen their argument for stress being an aetiological factor in the genesis of

perforated peptic ulcers. However, Illingworth, Scott and Jamieson (1944) studied the records of perforated ulcers which occurred in the West of Scotland during the years 1924—1943 and found a very marked rise in incidence in 1940—1941 followed by a drop thereafter. This rise preceded the air-raids on the West of Scotland but coincided with the time of Stewart and Winser's reported increase in incidence in London. Illingworth et al. suggested that anxiety about the war, overwork and possibly undernutrition might explain their similar findings in Scotland. This picture of a rising incidence in perforations in Britain was matched by what Lambling and Brissy (1942) described as a veritable "epidemie d'ulceres" in Paris in 1941 as well as similar increases reported for the same year in Austria by two different physicians (Slany, 1942; Mayr. 1948). There were no bombings or air-raids in these latter two situations although there was considerable social upheaval. Another account of psychic stress associated with perforated peptic ulcer was published by Hamperl in 1932 where a ten-fold increase in the incidence of perforations was shown to have taken place in Russia during the famine period of the 1920's but here diet (or the lack of it) may be presumed to have played a part as well.

Psychiatric studies have demonstrated a relationship between perforated peptic ulcer and psychic stress; for instance, Davies and Wilson found in 1939 that in 16 out of a series of 25 cases of perforated peptic ulcer there had been "an outstanding event in the patient's life which we felt could be regarded as producing an acute emotional stress"—the time interval between the "outstanding event" and the perforation being "days". The other 9 cases in Davies and Wilson's study were suffering from "chronic anxiety". Castelnuovo-Tedesco (1962) in a detailed psychiatric study of 20 patients under the age of 65 years, who represented consecutive admissions for gastric or duodenal perforation, found that "emotional factors were intimately involved in the perforation in a large majority of the cases".

In recent years much interest has been focussed on the acute stress ulcer syndrome which comprised 3.3 per cent of 909 admissions for perforation and haematemesis in the study of Hinchey, Hreno and Benoit (1970) for the years 1958—1968. They propounded a decrease in the efficiency of the mechanisms which defend the gastric and duodenal mucosae against attack by gastric acid secretions. Their proposition is based on Dragstedt's finding in 1956 that normal healthy volunteers had gastric acid levels within normal limits in response to stress. Further support for this viewpoint is provided by O'Neill's 1967 study on Curling's (post-burn) ulcer patients who without exception exhibited a low gastric acid output. The low acid secretion both in volume and concentration in gastric ulcer patients studied by James and Pickering in 1949 and Baron in 1963 is also consistent with the proposition of Hinchey et al.

Sibilly's 1974 review of the gastro-intestinal complications of stress summarize the collected experimental evidence for the destructive role of various substances on the gut muocosa e.g. alcohol, bile, urea, asprin, cortisone. Such destruction is expedited by pre-existing ischaemia or stasis of the gut, a view which is also amply supported by the evidence presented in Skillman's 1974 review. Sibilly also includes a series of 727 peptic ulcerations and haemorrhages all of which followed

surgical or non-surgical (e.g. respiratory failure) stress. It should be borne in mind however that the factors involved in the acute stress ulcer syndrome may not be the same factors as these involved in the vast majority (96.7 per cent in Hinchey et al.'s series) of peptic haemorrhages and perforations.

Our study however shows that under the conditions experienced in Belfast during the civil disturbances there was no increase in the incidence of perforated peptic ulcer and therefore our findings do not support any association between psychic stress and this condition.

Summary

A study of all the cases of perforated peptic ulcer in Belfast residents admitted to Belfast hospitals in the years 1967—1974 showed that the incidence of this condition during the years of civil disturbance 1969—1974 was at no time higher than in the preceding years 1967 and 1968. Closer studies of admissions for perforated peptic ulcer from the most troubled districts—the Falls and Shankill—confirmed that there has been no increase in incidence even among the residents of these districts.

These results call into question the potency of stress-induced anxiety of the type experienced in Belfast as an aetiological factor in the pathogenesis of perforated peptic ulcer.

Bibliography

Baron, J. H. (1963) *Gut* **4**, 243.

Brown, R. C., Langman, M. J. S., and Lambert, P. M. (1976) *British Medical Journal* **1**, 35.

Castelnuovo-Tedesco, P. (1962) *Psychosomatic Medicine* **24**, 398.

Davies, D. T. and Wilson, A. T. M. (1939) *Lancet* **2**, 723.

Dragstedt, L. R., Ragins, H. and Dragstedt, L. R. (Jr.) (1956) *Annals of Surgery* **144**, 450.

Hamperi, H. (1932) *Ergebnisse der allgemeine Pathologie und pathologische Anatomie* **26**, 353.

Hinchey, E. J., Hreno, A. and Benoit, P. R. (1970) *Advances in Surgery* **4**, 325.

Illingworth, C. F. W., Scott, L. D. W. and Jamieson, R. A. (1944) *British Medical Journal*, **2**, 655.

International Classification of Disease (1965) Eighth Revision W.H.O.

James, D. H. and Pickering, G. W. (1949) *Clinical Science* **8**, 181.

Lambling, A. and Brissy, S. (1942) *Memoires de l'Academie de Chirurgie (Paris)* **68**, 432.

Lyons, H. A. in Taylor, S. (Ed.) (1973) *Recent Advances in Surgery* **8**, 344.

Mayr, S. (1948) *Wiener Medizinische Wochenschrift* **98**, 205.

O'Neill, J. A. (Jr.), Pruitt, B. A. (Jr.), Moncrief, J. A. and Switzer, W. E. (1967) *Journal of Trauma* **7**, 275.

Osler, W. (1901) *The Principles and Practice of Medicine* 4th Edition, London.

Registrar General's Report for England and Wales 1953-1970 (1972). London: H.M.S.O.

Sibilly, A. and Boutelier, Ph. (1974) *Journal Chirurgique (Paris)* **108**, 117.

Skillman, H. (1974) *Surgery* **76**, 515.

Slany, A. (1942) *Wiener Klinische Wochenschrift* **55**, 171.

Spicer, C. C., Stewart, D. N. and Winser, D. M. de R. (1944) *Lancet* **1**, 14.

Stewart, D. N. and Winser, D. M. de R. (1942) *Lancet* **1**, 259.

MATERNAL, INFANT AND SOCIAL FACTORS ASSOCIATED WITH BIRTHWEIGHT

K. W. HARPER, B.Sc., M.B., B.Ch., B.A.O.*

Department of Social and Preventive Medicine
Queen's University of Belfast

* This paper was written as a result of a fifth year clerkship while a medical student.

IN 1900, the Infant Mortality Rate (I.M.R.) in Belfast was 153 per 1000 livebirths (Elwood, 1973). By 1971, the rate had fallen to 26 per 1000 (Registrar General's Report, 1973). This figure is, however, one of the highest in any city of comparable size in the United Kingdom. The I.M.R. in Birmingham in that year was 20 per 1000, in Bristol it was 17 and in Stoke on Trent 16, while even Teeside recorded 19.8.

Elwood and Pemberton (1971) examined possible reasons why the I.M.R. in Belfast was higher than in Birmingham and concluded that 40 per cent of the excess infant mortality in Belfast was accounted for by differences between the two livebirth distributions by birthweight. Low birthweight is known to be associated with increased neonatal mortality, and also with relative mental and physical impairment of surviving infants (Weiner and Milton, 1970), so any diminution in the number of infants of low birthweight would hopefully improve the situation with regard to both mortality and morbidity.

This study was undertaken in order to examine the relationship between birthweight and certain biosocial factors, and to identify some of the characteristics of mothers likely to have infants of low birthweight, and hopefully, to suggest means of reducing the incidence of low birthweight infants. Some characteristics of low birthweight infants were also studied.

Method

The records of the 867 live single births which occurred in the Royal Maternity Hospital, Belfast, between 1st January, 1974, and 31st May, 1974, were examined. Information concerning the selected biosocial factors was recorded on a prepared register, and then transferred to punch cards for analysis.

Tables of the distribution of infants by birthweight and a selected variable were prepared, and the chi square test applied in order to assess the significance of observed differences in the distributions. A difference was judged to be significant if the probability value 'p' was less than 0.05, i.e. if such a difference was likely to be reached or exceeded by chance alone less than once in 20 such comparisons.

A random sample of 50 records was extracted from the total of 867 records and used to calculate linear correlation coefficients on suitable parameters.

Each infant was allocated to one of the Registrar General's Social Classes based upon the occupation of the father. Social Classes I and II, and Social Classes IV, V and unemployed were combined for convenience of tabulation.

Copies of tables of results may be obtained on application to the Department of Social and Preventive Medicine, Queen's University of Belfast.

Results

Number of previous pregnancies

Mothers having a fourth or subsequent pregnancy significantly more commonly had babies at the extremes of the birthweight range ($p<0.02$). Also low birthweight was found more often than expected among first born infants.

Maternal Age

Older mothers were significantly much more likely to have infants in the very low or very high birthweight groups ($p<0.001$).

Maturity of fetus

Low birthweight babies were, not surprisingly, significantly more common among babies born before 38 weeks maturity ($p<0.001$).

Apgar score

An infant of low birthweight was significantly more likely to have a low Apgar score ($p<0.001$).

Religion of Mother

There was a significant difference ($p<0.01$) in the distribution of birthweights in Roman Catholic and non-Roman Catholic groups. The latter had a higher proportion of babies in the higher birthweight groups, i.e. over 3500g. There was little difference in the proportion in the low birthweight groups.

Height of Mother

The shorter mothers were significantly more likely to give birth to infants of low birthweight ($p<0.001$, $r=0.33$).

Social Class

Table 1 shows that mothers in social classes I and II were significantly more likely to have babies of heavier birthweight. Those in social classes IV, V and unemployed had more in the under 2500g. group ($p<0.01$).

Table 1
Distrbution of Birthweight by Social Class

Birthweight (g)	Social Class I, II No.	%	III No.	%	IV, V, Unemployed No.	%	Total No.	%
<2500	8	5.0	26	6.3	27	10.9	61	7.4
2500—	39	24.4	71	17.2	55	22.2	165	20.1
3000—	51	31.8	155	37.7	101	40.7	307	37.4
3500—	52	32.5	138	33.5	52	21.0	242	29.6
>4000	10	6.3	22	5.3	13	5.2	45	5.5
	160	100.0	412	100.0	248	100.0	820	100.0

$P<0.01$

Placenta weight and diameter

Birthweight was strongly correlated with placenta weight ($r=0.56$) and to a lesser degree with placenta diameter ($r=0.23$).

Hypoxia

Low birthweight infants had significantly more hypoxia ($p<0.001$).

Congenital defect

There was no significant relationship between live birthweight and the presence or absence of congenital defect.

Social Class and height of mother

Table 2 shows that social class is significantly associated with height of mother. The small mothers tended to be in social classes IV, V and unemployed, while the taller mothers tended to be in social classes I, II and III ($p<0.001$).

TABLE 2

Distribution of Social Class by Height of Mother

Social Class	Height of Mother (cm.)						Total	
	<149		150—		>160—			
	No.	%	No.	%	No.	%	No.	%
I, II	10	11.2	59	13.4	70	30.3	139	18.3
III	35	39.3	233	53.1	122	52.8	390	51.4
IV, V Unemployed	44	49.5	147	33.5	39	16.9	230	30.3
	89	100.0	439	100.0	231	100.0	759	100.0

$P<0.001$

DISCUSSION

From the results it can be seen why birthweight is closely related to infant mortality. Low birthweight infants, as has been shown before (Reid, 1961; Neligan, 1966), were of lower gestational age. They also had more hypoxia and had a lower Apgar score at birth. Placenta weight and diameter were lower in low birthweight infants, and perhaps placental insufficiency is an important factor in causing low birthweight, even in the absence of disease such as pre-eclampsia. On the other hand a small mother having a small baby may naturally have a small placenta with no insufficiency. Others have concluded that weight is a poor indicator of placental adequacy, and that placental insufficiency, on the basis of small placental size is probably rare (Thompson, Billewicz and Hytten, 1969). Congenital defect, a major cause of infant mortality in Northern Ireland was not associated with live birthweight in this study.

These factors arise as a result of pregnancy. Of interest are the environmental factors which exist before pregnancy begins. Older mothers and those having their fourth or subsequent pregnancy had more infants at the extremes of the birthweight range. The association of birthweight has already been shown with maternal age (Karn and Penrose, 1951) and parity (Jayant, 1966). High parity mothers are more likely to suffer from diabetes, rhesus iso-immunization and pre-eclampsia. Religion of the parents was associated with birthweight, but this factor was probably confounded with social class. Social class was associated with birthweight, the lower birthweight infants tending to be in the lower social classes.

Low maternal height was also associated with low birthweight and with lower social class. In Aberdeen, Thompson and Billewicz, (1963) have shown a relationship between maternal height and the nutritional status of the mother, concluding that tall women eat more, and on the whole eat better diets than short women, even when differences of body weight are allowed for. In Massachussets U.S.A., it has been shown that nutrition of pregnant women and the birthweight of the baby are strongly associated with her socio-economic status (Sacho, 1975) and in Montreal, with the addition of milk, eggs and oranges to the diet of pregnant women, the incidence of low birthweight was reduced from 9.0 per cent to 6.7 per cent (Higgins, 1973). A study of infants born to mothers in the Dutch Famine (1944–45) showed that deprivation of nutritional factors led to lower birthweight infants being born (Stein and Susser, 1975).

It can be concluded from this that low social class, low maternal height and low birthweight are all interrelated, and postulated that poor nutrition is the underlying cause of both low maternal height and low birthweight. Improving maternal height by better previous nutrition may subsequently improve infant birthweight. The preparation for pregnancy therefore begins in early childhood and it is not just sufficient to take care of the diet of women after pregnancy has begun.

When considering the association of maternal height and social class in the aetiology of low birthweight, it is interesting to note that relative to the rest of the United Kingdom incomes in Northern Ireland on average are lower (Commissioners of H.M. Inland Revenue 1967) and there is also a higher proportion of families in Social Class V. In Northern Ireland and Scotland there is also much more overcrowding than in England and Wales (Census Reports, 1961). This may partly account for the higher infant mortality in Belfast relative to other cities in the United Kingdom.

In retrospective study it was not possible to ascertain the smoking status of the mother. Russell, Taylor and Madison (1966) showed that the smoking of five or more cigarettes per day resulted in lower birthweight infants than in mothers who smoked less or were non-smokers. The finding that smoking is associated with a lower weight gain in the mother during pregnancy (Rush, 1975), and that maternal weight gain during gestation is strongly associated with birthweight (Rush, Davis and Susser, 1972), would further suggest that nutrition during pregnancy has an effect on birthweight.

Conclusion

Some 98 per cent of mothers in Belfast now have their babies in hospital where the obstetric and paediatric services are highly efficient. The causes of the high infant mortality rate associated with a high proportion of low birthweight babies are therefore likely to lie outside the hospital. Poor social conditions in general, perhaps a poor diet in the antenatal period and even in the mother's childhood causing reduced stature, appear to be of aetiological importance for low birthweight. The continued improvement in the diet of children and of social conditions in general can be expected to have a beneficial effect eventually on the I.M.R. In addition the extension of the use of family planning in Social Classes IV and V and among the unemployed by reducing the number of high parity babies should help to reduce the number of babies at special risk.

At present the Department of Health and Social Services is monitoring the nutritional status of the population, including the nutritional health of women during pregnancy, and financing further research into family planning (D.H.S.S. Annual Report, 1973).

Summary

Data on all singleton livebirths in the Royal Maternity Hospital, Belfast from 1st January, 1974 until 31st May, 1974 were analysed to identify maternal, infant and social factors associated with birthweight. Age, height, parity, religion and social class of the mother, maturity of the fetus, Apgar score, placenta weight and diameter and hypoxia in the infant were all significantly associated with birthweight. Social class was also significantly associated with maternal height.

It is suggested that an improvement in general social conditions and an increase in the average height of future mothers brought about by better nutrition in childhood and an extension of family planning in Social Classes IV and V and the unemployed, would reduce the numbers of low birthweight babies and, as a consequence, reduce the rather high infant Mortality Rate in Belfast.

My thanks are due to Professor J. Pemberton and Dr. Scott of the Department of Social and Preventive Medicine for the opportunity to write this paper and for their advice and encouragement; to Mrs. I. Hay for preparation of the tables for analysis from the registers; to my fellow students, especially Miss J. Hall, Mr. R. Harrison, Mr. N. Hicks and Miss S. Holmes for collection of the data; and to the consultant staff of the Royal Maternity Hospital Belfast for allowing us to use the clinical records of the hospital from which the data were taken.

References

Census Reports: Northern Ireland, England and Wales, and Scotland (1961). H.M.S.O.

D.H.S.S. Annual Report (1973). Cmnd. 5700. H.M.S.O. London.

ELWOOD, J. H. (1973). *Irish Journal of Medical Science*, **142**, 166.

ELWOOD, J. H. and PEMBERTON, J. (1971). *Archives of Disease in Childhood*, **46**, 332.

HIGGINS, A. C. (1973). *Montreal Diet Dispensary Study*. Presented at the Workshop of Nutritional Supplementation and the Outcome of Pregnancy. Committee on Maternal Nutrition. National Academy of Sciences, Washington, D.C.

H.M. Commissioners of Inland Revenue (1967). Cmnd. 3200. H.M.S.O. London.

JAYANT, K. (1966). *Annals of Human Genetics*, **29**, 363.

KARN, M. N. and PENROSE, L. S. (1951). *Annals of Eugenics*, **19**, 147.

NELIGAN, G. A. (1966). In *Gestational Age, Size and Maturity*, (Clinics in Developmental Medicine, 19), p. 45. Edited by M. J. R. Dawkins and W. G. MacGregor. Heinemann, London.

Registrar General (1973). *Annual Report for Northern Ireland* (1973). H.M.S.O. Belfast.

REID, S. M. (1961). *Journal of Obstetrics and Gynaecology of the British Commonwealth*, **76**, 865.

RUST, D. (1974). *Journal of Obstetrics and Gynaecology of the British Commonwealth*, **81**, 746.

RUSH, D., DAVIS, H., and SUSSER, M. W. (1972). *International Journal of Epidemiology*, **1**, 375.

RUSSELL, C. S., TAYLOR, R. and MADDISON, R. N. (1966). *Journal of Obstetrics and Gynaecology of the British Commonwealth*, **73**, 742.

SACHO, B. (1975). *New England Journal of Medicine*, **292**, 208.

STEIN, Z. and SUSSER, M. (1975). *Paediatric Research*, **9**, 70.

THOMPSON, A. M. and BILLEWICZ, W. Z. (1963). *Proceedings of the Nutrition Society*, **22**, 55.

THOMPSON, A. M., BILLEWICZ, W. Z. and HYTTEN, F. E. (1969). *The Journal of Obstetrics and Gynaecology of the British Commonwealth*, **76**, 865.

WEINER, G. and MILTON, T. (1970). *American Journal of Epidemiology*, **91**, 260.

BOOK REVIEWS

CLINICAL PHARMACOLOGY. By R. H. Girdwood. Twenty-third Edition. (Pp. 549; Figures 75. £5.50). London : Bailliere Tindall. 1976.

THIS is the latest edition of one of the classical textbooks of pharmacology, formerly Dilling's Clinical Pharmacology. However, it now has a new Editor and has been completely re-written with a view to reaching both undergraduates and qualified doctors. This dual aim may represent a weakness, for in some areas the information given is complex and concentrated, and in others rather superficial. There is also a rather confusing tendency to describe the properties of some groups of drugs, e.g., adrenergic receptor blocking drugs, in more than one place. In neither place is the subject covered fully and gaps exist between the two: both α - and β-adrenergic receptor blocking drugs are mentioned as being used to treat phaeochromocytoma, but it is not stated that β-blocking dugs must not be given unless α - blockade has already been instituted. On occasions the properties of newer drugs are described in terms that resemble the manufacturers' claims rather than objective assessment of the current literature about them. However, despite these criticisms, the book now appears to be more relevant to present day medical students than the previous edition. It also has the advantage of being relatively up-to-date in an ever advancing subject.

All such books must inevitably be compared with the standard text in this discipline—Laurence's Clinical Pharmacology. In my opinion, it is not likely to compete favourably or replace this latter volume. It is not as readible, information is not as easily assimilated from it, and the bibliographies at the end of each chapter are less comprehensive. In addition, it is larger and more than twice the price.

D.G.McD.

STUDIES OF THE HYPOTHALAMUS AND THE PITUITARY GLAND with special reference to the effects of transection of the pituitary stalk. By Peter M. Daniel and Marjorie M. L. Prichard. (Pp. X + 216; figures 104, £3.00). Oxford: Alden Press. 1975.

THIS is a useful monograph for those interested in experimental neuroendocrinology. It records and summarises the personal research work of the authors, carried out over a period of 25 years. Peter Daniel and Marjorie Prichard have made major contributions to the study of the anatomy of the hypothalamus and pituitary gland and their work on the blood supply to this region is of particular importance. This monograph is not without clinical interest in that both the local and remote effects of pituitary stalk section and hypophysectomy are dealt with. For anyone interested in neuroendocrinology this is a useful volume which is very reasonably priced.

I.V.A.

AN INTRODUCTION TO HUMAN PHYSIOLOGY. By J. H. Greer. Fourth (S.I.) Edition. (Pp. X + 232, £3.80). London: Oxford University Press. 1976.

THIS is not just the fourth edition of this popular text, it is the "Fourth (S.I.) Edition". It recognizes the fact tha we have to live in the difficult era when we need to carry two sets of units in our heads to cope with everyday life in medical practice. Students who are brought up on S.I. units should have no difficulty in assimilating them, but for some years they will also

BOOK REVIEWS

CLINICAL PHARMACOLOGY. By R. H. Girdwood. Twenty-third Edition. (Pp. 549; Figures 75. £5.50). London : Bailliere Tindall. 1976.

THIS is the latest edition of one of the classical textbooks of pharmacology, formerly Dilling's Clinical Pharmacology. However, it now has a new Editor and has been completely re-written with a view to reaching both undergraduates and qualified doctors. This dual aim may represent a weakness, for in some areas the information given is complex and concentrated, and in others rather superficial. There is also a rather confusing tendency to describe the properties of some groups of drugs, e.g., adrenergic receptor blocking drugs, in more than one place. In neither place is the subject covered fully and gaps exist between the two: both α - and β-adrenergic receptor blocking drugs are mentioned as being used to treat phaeochromocytoma, but it is not stated that β-blocking dugs must not be given unless α - blockade has already been instituted. On occasions the properties of newer drugs are described in terms that resemble the manufacturers' claims rather than objective assessment of the current literature about them. However, despite these criticisms, the book now appears to be more relevant to present day medical students than the previous edition. It also has the advantage of being relatively up-to-date in an ever advancing subject.

All such books must inevitably be compared with the standard text in this discipline—Laurence's Clinical Pharmacology. In my opinion, it is not likely to compete favourably or replace this latter volume. It is not as readible, information is not as easily assimilated from it, and the bibliographies at the end of each chapter are less comprehensive. In addition, it is larger and more than twice the price.

D.G.McD.

STUDIES OF THE HYPOTHALAMUS AND THE PITUITARY GLAND with special reference to the effects of transection of the pituitary stalk. By Peter M. Daniel and Marjorie M. L. Prichard. (Pp. X + 216; figures 104, £3.00). Oxford: Alden Press. 1975.

THIS is a useful monograph for those interested in experimental neuroendocrinology. It records and summarises the personal research work of the authors, carried out over a period of 25 years. Peter Daniel and Marjorie Prichard have made major contributions to the study of the anatomy of the hypothalamus and pituitary gland and their work on the blood supply to this region is of particular importance. This monograph is not without clinical interest in that both the local and remote effects of pituitary stalk section and hypophysectomy are dealt with. For anyone interested in neuroendocrinology this is a useful volume which is very reasonably priced.

I.V.A.

AN INTRODUCTION TO HUMAN PHYSIOLOGY. By J. H. Greer. Fourth (S.I.) Edition. (Pp. X + 232, £3.80). London: Oxford University Press. 1976.

THIS is not just the fourth edition of this popular text, it is the "Fourth (S.I.) Edition". It recognizes the fact tha we have to live in the difficult era when we need to carry two sets of units in our heads to cope with everyday life in medical practice. Students who are brought up on S.I. units should have no difficulty in assimilating them, but for some years they will also

BOOK REVIEWS

CLINICAL PHARMACOLOGY. By R. H. Girdwood. Twenty-third Edition. (Pp. 549; Figures 75. £5.50). London : Bailliere Tindall. 1976.

THIS is the latest edition of one of the classical textbooks of pharmacology, formerly Dilling's Clinical Pharmacology. However, it now has a new Editor and has been completely re-written with a view to reaching both undergraduates and qualified doctors. This dual aim may represent a weakness, for in some areas the information given is complex and concentrated, and in others rather superficial. There is also a rather confusing tendency to describe the properties of some groups of drugs, e.g., adrenergic receptor blocking drugs, in more than one place. In neither place is the subject covered fully and gaps exist between the two: both α - and β-adrenergic receptor blocking drugs are mentioned as being used to treat phaeochromocytoma, but it is not stated that β-blocking dugs must not be given unless α - blockade has already been instituted. On occasions the properties of newer drugs are described in terms that resemble the manufacturers' claims rather than objective assessment of the current literature about them. However, despite these criticisms, the book now appears to be more relevant to present day medical students than the previous edition. It also has the advantage of being relatively up-to-date in an ever advancing subject.

All such books must inevitably be compared with the standard text in this discipline—Laurence's Clinical Pharmacology. In my opinion, it is not likely to compete favourably or replace this latter volume. It is not as readible, information is not as easily assimilated from it, and the bibliographies at the end of each chapter are less comprehensive. In addition, it is larger and more than twice the price.

D.G.McD.

STUDIES OF THE HYPOTHALAMUS AND THE PITUITARY GLAND with special reference to the effects of transection of the pituitary stalk. By Peter M. Daniel and Marjorie M. L. Prichard. (Pp. X + 216; figures 104, £3.00). Oxford: Alden Press. 1975.

THIS is a useful monograph for those interested in experimental neuroendocrinology. It records and summarises the personal research work of the authors, carried out over a period of 25 years. Peter Daniel and Marjorie Prichard have made major contributions to the study of the anatomy of the hypothalamus and pituitary gland and their work on the blood supply to this region is of particular importance. This monograph is not without clinical interest in that both the local and remote effects of pituitary stalk section and hypophysectomy are dealt with. For anyone interested in neuroendocrinology this is a useful volume which is very reasonably priced.

I.V.A.

AN INTRODUCTION TO HUMAN PHYSIOLOGY. By J. H. Greer. Fourth (S.I.) Edition. (Pp. X + 232, £3.80). London: Oxford University Press. 1976.

THIS is not just the fourth edition of this popular text, it is the "Fourth (S.I.) Edition". It recognizes the fact tha we have to live in the difficult era when we need to carry two sets of units in our heads to cope with everyday life in medical practice. Students who are brought up on S.I. units should have no difficulty in assimilating them, but for some years they will also

need the older units that their seniors will not abandon. The book makes a constructive attempt to take the potential difficulty and confusion out of the unfortunate situation and is usually successful. However, some of the hints may depress the older reader. To convert the old millimetres of mercury into the new kilopascals, the reader is advised to multiply by 4 and divide by 30 or, alternatively, double, double again, then divide by 3 and, finally, divide by 10. One would hope that the patients life did not hang too critically on the answer being correct.

Leaving these problems aside, however, the book still forms a very straight forward and concise introduction to human physiology.

I.C.R.

A MANUAL OF OPERATIVE DENTISTRY. By H. M. Pickard, F.D.S., R.C.S. (Eng.), M.R.C.S. (Eng.). Fourth Edition. (Pp. 189; figures 218, £3.50). London: Oxford University Press. 1976.

IN his preface Professor Pickard states that his purpose is to describe the simpler procedures of operative dentistry and to relate them to underlying principles. He explains that this manual is intended to replace none of the other standard text books but to supplement them. In its thirteen chapters his book attains these objectives. There do not seem great changes from the third edition published in 1970, although it is stated, on the back cover, that Professor Pickard has "rewritten much of the book and has brought all the chapters up to date".

The first chapter is concerned with the operator and his environment, it describes patient and operator positions, lighting, chairside assistance and surgery layout in straightforward language and is a useful introduction to the techniques of "four handed dentistry" and dental ergonomics. It has been updated by the inclusion of some new clinical photographs which illustrate patient and operator positions. The technique of operating on a supine patient is advocated for some procedures.

The next three chapters deal with instruments, examination of patients and the control of moisture, pain and trauma in operative dentistry.

Chapter five shows the principles of cavity preparation and explains cavity lining techniques.

The following six chapters describe amalgam, silicate, acrylic and composite resin restorations and the making of gold inlays by both direct and indirect techniques. The remaining two chapters are devoted to techniques of endodontia.

In the chapter on instruments scanning electron micrographs have been added to illustrate cavity surfaces prepared by various instruments and there is reference to the recent literature on preparation of cavity margins. The chapter on silicate cements and resins now includes a description of the use of composite resins in Class IV cavities. The use of pins and the acid etch technique to enhance retention is discussed briefly but when describing the acid etch technique no mention is made of any preparatory cleansing of the enamel to be etched. The illustration fig. 101 on page 94 is rather loosely drawn in that the position of the incisal retention when viewed from the mesial aspect seems to be undermining the palatal enamel. This raises the question of how accurate "line drawings" should be, especially when aimed at the junior student. Proof reading errors noted were on page 90, fig. 96 B "small preparation with mesial retention", instead of "cervical and incisal retention". On page 100, "articles" instead of "particles". On page 114, a "medium hard" 20 carat gold was recommended whilst on page 115 in the same context, one reads, "If a medium soft gold, such as 20 carat, had been used". On page 114, "maide" instead of "made".

Apart from such minor points this is a very good book and can be readily recommended to all those, student and graduate, who have not yet read it.

At £3.50 the price has risen £2.00 since the previous edition in 1970 but this is in keeping with the current trend in book prices and, perhaps, the extra five pages make it worth it.

A.S.

need the older units that their seniors will not abandon. The book makes a constructive attempt to take the potential difficulty and confusion out of the unfortunate situation and is usually successful. However, some of the hints may depress the older reader. To convert the old millimetres of mercury into the new kilopascals, the reader is advised to multiply by 4 and divide by 30 or, alternatively, double, double again, then divide by 3 and, finally, divide by 10. One would hope that the patients life did not hang too critically on the answer being correct.

Leaving these problems aside, however, the book still forms a very straight forward and concise introduction to human physiology.

I.C.R.

A MANUAL OF OPERATIVE DENTISTRY. By H. M. Pickard, F.D.S., R.C.S. (Eng.), M.R.C.S. (Eng.). Fourth Edition. (Pp. 189; figures 218, £3.50). London: Oxford University Press. 1976.

IN his preface Professor Pickard states that his purpose is to describe the simpler procedures of operative dentistry and to relate them to underlying principles. He explains that this manual is intended to replace none of the other standard text books but to supplement them. In its thirteen chapters his book attains these objectives. There do not seem great changes from the third edition published in 1970, although it is stated, on the back cover, that Professor Pickard has "rewritten much of the book and has brought all the chapters up to date".

The first chapter is concerned with the operator and his environment, it describes patient and operator positions, lighting, chairside assistance and surgery layout in straightforward language and is a useful introduction to the techniques of "four handed dentistry" and dental ergonomics. It has been updated by the inclusion of some new clinical photographs which illustrate patient and operator positions. The technique of operating on a supine patient is advocated for some procedures.

The next three chapters deal with instruments, examination of patients and the control of moisture, pain and trauma in operative dentistry.

Chapter five shows the principles of cavity preparation and explains cavity lining techniques.

The following six chapters describe amalgam, silicate, acrylic and composite resin restorations and the making of gold inlays by both direct and indirect techniques. The remaining two chapters are devoted to techniques of endodontia.

In the chapter on instruments scanning electron micrographs have been added to illustrate cavity surfaces prepared by various instruments and there is reference to the recent literature on preparation of cavity margins. The chapter on silicate cements and resins now includes a description of the use of composite resins in Class IV cavities. The use of pins and the acid etch technique to enhance retention is discussed briefly but when describing the acid etch technique no mention is made of any preparatory cleansing of the enamel to be etched. The illustration fig. 101 on page 94 is rather loosely drawn in that the position of the incisal retention when viewed from the mesial aspect seems to be undermining the palatal enamel. This raises the question of how accurate "line drawings" should be, especially when aimed at the junior student. Proof reading errors noted were on page 90, fig. 96 B "small preparation with mesial retention", instead of "cervical and incisal retention". On page 100, "articles" instead of "particles". On page 114, a "medium hard" 20 carat gold was recommended whilst on page 115 in the same context, one reads, "If a medium soft gold, such as 20 carat, had been used". On page 114, "maide" instead of "made".

Apart from such minor points this is a very good book and can be readily recommended to all those, student and graduate, who have not yet read it.

At £3.50 the price has risen £2.00 since the previous edition in 1970 but this is in keeping with the current trend in book prices and, perhaps, the extra five pages make it worth it.

A.S.

COMMUNITY HEALTH INVESTMENT Health Services Research in Belgium, France, Federal German Republic and the Netherlands. By Jan Blanpain and Luk Delesie. Edited by Gordon McLachlan. (Pp. XIII + 474, £8.50). London: Oxford University Press for Nuffield Provincial Hospitals Fund. 1976.

HEALTH Services research is defined in summary form by the authors as "an organized and rigorous inquiry into aspects of the effectiveness of medical care", and they use the term "medical care" to include "preventive, diagnostic, curative, rehabilitative, supportive and terminal care".

The authors are researchers in the Institute for European Health Services Research, based at Leuven University, Belgium and located near to the headquarters of the European Economic Community. In this book they have set out to list, categorise and evaluate an extensive range of research projects (324 in all) being undertaken in Belgium, France, Federal German Republic and the Netherlands. Each project is summarised, with emphasis on its type, scope and methodology. Also included in the book is a review of the organisation of health services research in each country along with lists of institutions and individual researchers. So, clearly, this is a book for researchers engaged in this field. For them this is an important publication made even more relevant by the advances in medical 'harmonisation' taking place within the E.E.C.

The more general reader would like to know more about the conclusions of many of these projects, an aspect on which very little emphasis has been placed. Findings are mentioned occasionally, however. A Dutch Study for example, found support for what we call "Parkinson's Law", and expressed it as follows—"the elasticity of the length of the admission rate per 1,000 population is greater than the elasticity of the length of stay", which in non-technical language means, "empty beds are easier to fill than beds occupied to empty".

Non-specialist readers may find useful information in the more general sections of the book dealing with medical organisation in these countries.

R.B.

SYMPOSIUM: MALIGNANT DISEASE. Edited by A. T. Proudfoot. (Pp. 145; Illustrated. £3.00). Edinburgh: Royal College of Physicians. 1976.

THIS is a report with some updating of the papers of a symposium held in the Royal College of Physicians in Edinburgh on 5th and 6th December 1974. It presents a valuable review of many aspects of modern thinking on malignant disease. The first five articles review advances in radiology, investigation of breast disease, ultrasound, exfoliative cytology and the study of tumour-associated "antigens". T. Symington from the Chester Beatty Research Institute then contributes a fundamental, but difficult, survey on he biology of carcinogenesis. The last 60 pages review aspects of treatment—surgery, chemotherapy, radiotherapy and immunotherapy and the care of the dying and the relief of pain.

The symposium succeeds better than most in conveying to the reader not only a wealth of information, but also something of the excitement and hope new methods are bringing in both diagnosis and treatment. The contributions are all of a very high standard. It must impress on anyone that great resources of both devoted service and sophisticated equipment are needed if hopeful modern methods are to be made available. How a health service starved of facilities and not prepared to reward dedicated service can remain active in this great endeavour should be a cause for concern.

J.E.M.

COMMUNITY HEALTH INVESTMENT Health Services Research in Belgium, France, Federal German Republic and the Netherlands. By Jan Blanpain and Luk Delesie. Edited by Gordon McLachlan. (Pp. XIII + 474, £8.50). London: Oxford University Press for Nuffield Provincial Hospitals Fund. 1976.

HEALTH Services research is defined in summary form by the authors as "an organized and rigorous inquiry into aspects of the effectiveness of medical care", and they use the term "medical care" to include "preventive, diagnostic, curative, rehabilitative, supportive and terminal care".

The authors are researchers in the Institute for European Health Services Research, based at Leuven University, Belgium and located near to the headquarters of the European Economic Community. In this book they have set out to list, categorise and evaluate an extensive range of research projects (324 in all) being undertaken in Belgium, France, Federal German Republic and the Netherlands. Each project is summarised, with emphasis on its type, scope and methodology. Also included in the book is a review of the organisation of health services research in each country along with lists of institutions and individual researchers. So, clearly, this is a book for researchers engaged in this field. For them this is an important publication made even more relevant by the advances in medical 'harmonisation' taking place within the E.E.C.

The more general reader would like to know more about the conclusions of many of these projects, an aspect on which very little emphasis has been placed. Findings are mentioned occasionally, however. A Dutch Study for example, found support for what we call "Parkinson's Law", and expressed it as follows—"the elasticity of the length of the admission rate per 1,000 population is greater than the elasticity of the length of stay", which in non-technical language means, "empty beds are easier to fill than beds occupied to empty".

Non-specialist readers may find useful information in the more general sections of the book dealing with medical organisation in these countries.

R.B.

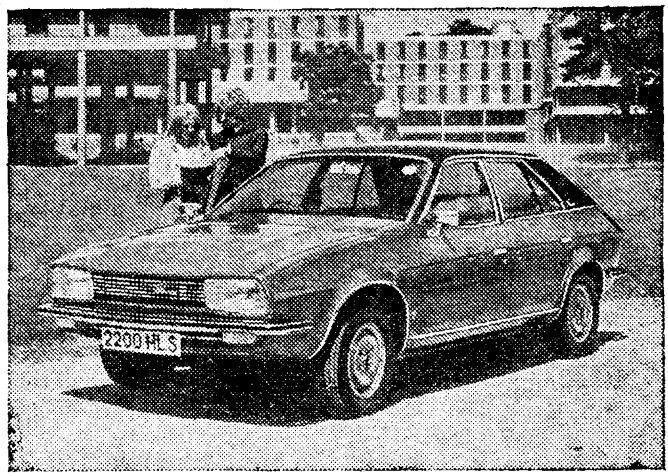
SYMPOSIUM: MALIGNANT DISEASE. Edited by A. T. Proudfoot. (Pp. 145; Illustrated. £3.00). Edinburgh: Royal College of Physicians. 1976.

THIS is a report with some updating of the papers of a symposium held in the Royal College of Physicians in Edinburgh on 5th and 6th December 1974. It presents a valuable review of many aspects of modern thinking on malignant disease. The first five articles review advances in radiology, investigation of breast disease, ultrasound, exfoliative cytology and the study of tumour-associated "antigens". T. Symington from the Chester Beatty Research Institute then contributes a fundamental, but difficult, survey on he biology of carcinogenesis. The last 60 pages review aspects of treatment—surgery, chemotherapy, radiotherapy and immunotherapy and the care of the dying and the relief of pain.

The symposium succeeds better than most in conveying to the reader not only a wealth of information, but also something of the excitement and hope new methods are bringing in both diagnosis and treatment. The contributions are all of a very high standard. It must impress on anyone that great resources of both devoted service and sophisticated equipment are needed if hopeful modern methods are to be made available. How a health service starved of facilities and not prepared to reward dedicated service can remain active in this great endeavour should be a cause for concern.

J.E.M.

Prescribed Motoring



The luxurious 2200 HLS is the top model of the Princess range. It's the car for those accustomed to the good things in life. And we can offer immediate delivery.

As befits the most exclusive Princess of all, it has much to distinguish it. The front passenger seat is adjustable up-and-down as well as fore-and-aft, in the same way as the driver's seat. Both front seats are fully reclining. There's also extra lighting. Front and rear passenger lights, a light in the glove box, under the bonnet and, of course, in the luggage compartment.

The lively yet economical six-cylinder 2227 cc engine is complemented by a responsive four forward-speed, synchromesh gearbox—or, at extra cost, by an automatic gearbox.

And this great Princess comes with all-independent Hydragas(R) suspension, power-assisted steering, dual-circuit power-assisted brakes, unique Supercover—and much, much, more . . . .

CHARLES HURST MOTORS LTD.

Donegall Square, Belfast 1 Telephone 30566

Breda, Supermac, Saintfield Road Telephone 649774

Princess

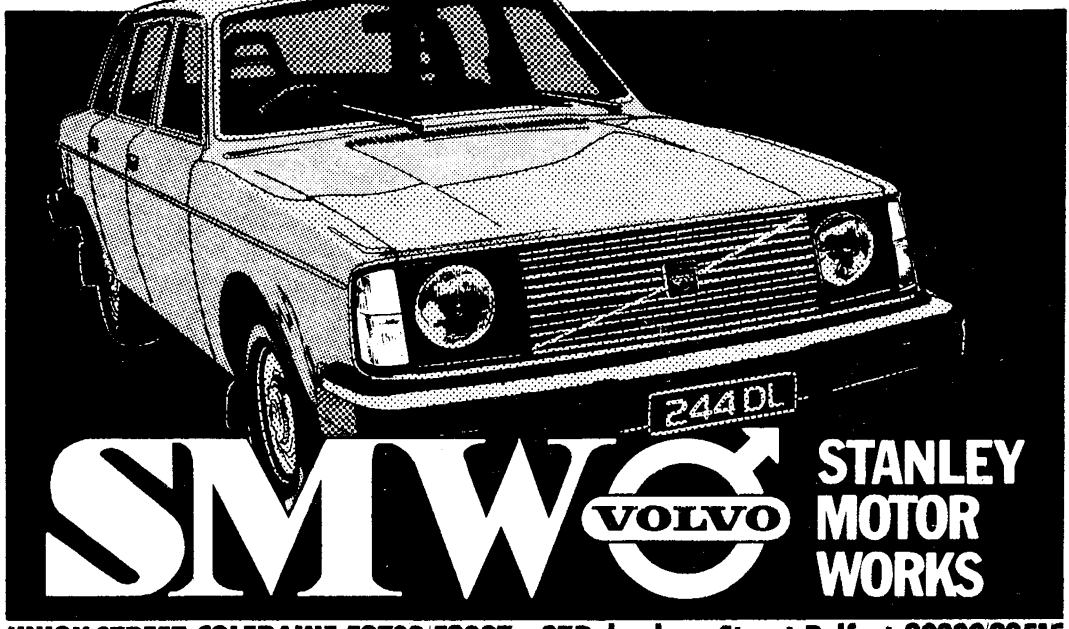
Take a good look at the most unusual 1st in motoring history

Volvo Running lights.

You've probably seen them already. Volvos cruising past with lights shining in daytime. And – go on, admit it – you've flashed them. Well Volvo running lights are deliberate. Linked to the car's ignition system, they are part of the unique Volvo safety policy. Another Volvo first; to see you safely through the traffic. Part of the great Volvo tradition of constructing better cars.

For a new experience in motoring, telephone *John Kerr on Belfast 22694 for a Test Drive.

DRIVE VOLVO : You owe it to yourself– and your family



SMW VOLVO STANLEY MOTOR WORKS

UNION STREET, COLERAINE 52703/52387 27 Pakenham Street, Belfast 29399/23515

Late opening Tuesday & Thursday until 8pm. Saturday until noon.